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Rail-Road News.

Charleston and Memphis Railroad.

The Commissioners' Court of Lauderdale county, in Tennessee, has subscribed $30,000 to the Charleston and Memphis Railroad, provided the road be located on the north side of the Tennessee river, in that county. Madison county has subscribed $100,000, unconditionally, to the same enterprise, and the people of Marshall county, Mississippi, have voted, nearly unanimously, to contribute the same amount.

Utica and Susquehanna Railroad.

At a recent meeting at Utica, N. Y., of those favorable to the building of a road to run from that place and intersect the New York and Erie Railroad, a committee reported in favor of laying the route through the valley of the Unadilla and Susquehanna, cutting the New York and Erie road at Deposit, as a terminus, with a branch from a point four miles north for the purpose of receiving coal. The road will be 84 miles long, and will cost $1,680,000. A committee was appointed to draw up articles of association.

Georgia Railroad

The Macon Messenger says that the entire length of the Georgia Railroads now in operation, viz: the Central, Georgia, Macon and Western, and Western and Atlanric Roads and Athens Branch, is 642 miles. The extent of railroads completed and in progress is 956 miles. The roads already in operation are all prosperous, and are realizing from 8 to 16 per cent. clear profits per annum. Thus is demonstrated the wisdom and importance of a proper system of improvements. Georgia after expending nearly fourteen millions of dollars is now twice as rich as when she commenced her noble enterprise.

Liabilities of Railroad Companies.

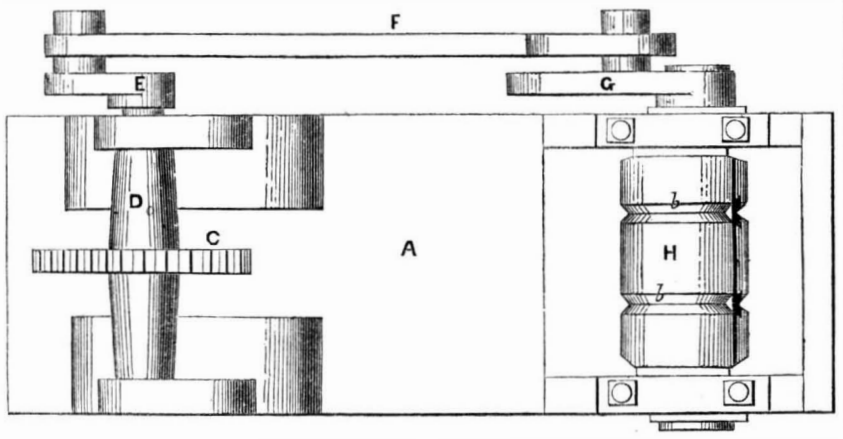
The Supreme Court of Massachusetts, by a second decision, have laid down the principle that railroad companies are not liable for a person, not a passenger, injured or killed while carelessly upon the track. Upon this question of law the case will go before the whole Court.

Artesian Well

Mr. Welton, says the Charleston Mercury of the 1st, has gone to the depth of one thousand feet and is now engaged in putting down his tubes to secure further operations. For nearly this whole depth, with the exception of a few occasional boulders, he has cut through a bed of marl. We have not seen the chemical analysis, but such is the appearance. His latest borings show a considerable increase of sand, and the rise of water above the surface is a very hopeful indication.

There are now sixty-five steamboats on the California waters. Three years ago there was not one.

SPIKE MAKING MACHINERY.---Figure 1.



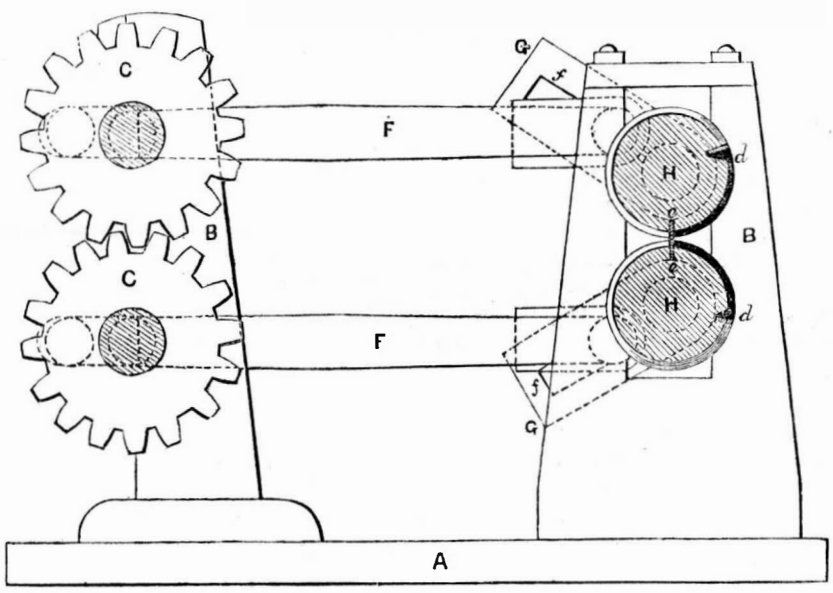
This is an improvement on Spike Making Machinery, by Mr. Thomas Rogers, of the Bergen Iron Works, New Jersey, who has taken measures to secure a patent.

Figure 1 is a plan view, and figure 2 is a side elevation, with one side of the frame removed. The same letters refer to like parts.

The two feeding rolls in this machine are also the forming and cutting rolls. They are provided with grooves running round their peripheries to form the shanks, and they have also indents to form the heads with knives to cut them off. Each roller may have any number of grooves, and these may be semi-round or consisting of the diagonal of a square, as the two in figure 1 is represented to be. Each roller has its groove made half the form, and the depth of the one in the roller above it, so that the two grooves coming together form the spike, bolt, or whatever it may be, between them, by their united form and action. The two spike rolls do not revolve entirely, but have a semi-rotary motion, moving forward to form the spike and then back to receive another. A is the bed of the machine; B B are uprights, forming the standing frame; C C are two cog wheels with shafts, D; they have their bearings in the uprights. These cog-wheels gear into one another, and may be driven by any convenient power, steam or otherwise; E E are two cranks keyed on the shafts, D, of the cog-wheels—one on each. These cranks are placed one above another, and are attached to connecting rods, F F; these connecting rods are connected to a kind of crank levers, G G, into the shoulders of which the outer ends of the spike rollers are inserted. These levers have slots, *f f*, in them. The cranks, E E, the connecting rods, F F, and the crank levers, G G, are of equal length and placed one above the other; it will therefore be observed that, as the cog-wheels, C C, revolve, their cranks will only give a semi-rotative motion to the rolls, H H, by the slotted crank levers, G G. The feed rolls, H H, are made with grooves, *b b*, running around them. These grooves receive the iron bars for the spikes. There is also an indent, *d d*, upon each roll; this indent is to form the head of the spike. The end of the bar, for the point, is fed in against a longitudinal ridge or division, *e e*, in the groove of each roller, and as it is rolled in and pressed in the grooves into the proper form, the indents, *d d*, meet together and press the iron into them, as into a sunk die, and the head is formed at the back of the heading die; there is a metal knife running across the groove, which cuts off the bar, and answers for a back to the *header*. When one spike is cut, the rollers move back and another is fed in. The slots, *f f*, allow the stroke—to use a common expression—of the rolls to be altered so as to answer for the making long and short spikes, bolts, &c. The spikes may be pointed in any way most convenient. The connecting rods, F F, are secured to the crank leves, G G, at distances from the centre of the rolls exceeding the throw of the cranks, thereby causing the rolls, H H, to draw in between their gooves the heated rods of metal against the metal butts or ridges, *e e*, as shown in fig. 2. The stopping plates for heading will be observed at *d d*. When no heads are required for spikes, the rolls do not require to have the heading indents in them; therefore, one set of rolls may be made with grooves, to make more than one kind of spikes, and they can easily be set to work on any section of the grooves, by altering the ends of the rolls in the openings of the slotted levers, G G.

More information may be obtained by letter addressed to Mr. Rogers.

Figure 2.



To Make Good Mortar.

Sour together a quantity of lime and clean sharp sand, for two or three weeks before being used; work this well and turn it aside, and as the proportion of lime to the sand will always depend on the quality of the former, all that is necessary, is to take care (in souring), if the lime is of a rich quality, to put one-third less lime into the heap than it is intended to be built with; and if the lime is of pure quality, say only one-fourth less. It may here be observed that in general, lime of the proper quality is best for cementing building. When the lime which has been previously soured, as before directed, is to be used in the building, or otherwise, it is to be again worked carefully over, and one-fourth of quick-lime added in proportions, taking care never to have more in preparation than can be used in a short time; and this quick lime should be most completely beaten and incorporated with the soured lime, and it will be found to have effect of causing the old lime to set and bind in the most complete manner.—It will become perfectly solid without the least evaporation to occasion cracks, which can only ensue in consequence of evaporation; and this can only happen from the want of proper union between the two bodies. But by mixing and beating the quick-lime with the soured mortar, immediately before it is applied to use, the component parts are brought so near to each other, that it is impossible either crack or flaw can take place. In short, beating has the effect of closing the interstices of the sand, and a small quantity of lime paste is effectual in fitting and holding the grains together, so as to form a plastic mass, by uniting the grains of sand which otherwise would not fit each other. This system will apply to the lime mortar for all descriptions of work, whether for building, plastering in the inside or outside of houses, water cisterns, ground vaults, rough castings, &c.

Remedy for Burns.

Dr. Reese, late physician of Bellevue Hospital, New York, has been making experiments concerning the best mode of healing burns and scalds, and checking the acute suffering. He has found that flour, thrown on with a common dredging box, is one of the best and most efficient remedies yet discovered. The external air is one cause of suffering, and the flour thus applied, both heals and closes the wounds to the atmosphere. The edges of the wounds which remained open he dressed with lime and oil, applied by a feather. Dr. Reese says the above application made to wounds by fire, hot water, gunpowder, &c., has been most happy in the practice at the Hospital.

[We published the above once before in more extended form, and we do it once more, in a few words, to say that we have seen it tried with poor success.

Yankee Clock Business.

Mr. C. Jerome, of New Haven, Conn., manufactures upwards of five hundred clocks, of various patterns, every day, and the demand is equal to the supply. In the State of Connecticut, one thousand clocks are made daily. Within late years this Yankee clock business has wonderfully increased, and is very profitable. In England, Yankee clocks have superseded all others.

To Preserve Books from Insects.

Introduce into every volume some leaves of a pungent odor, such as rosemary, or submit them frequently to the vapor of oil of turpentine.

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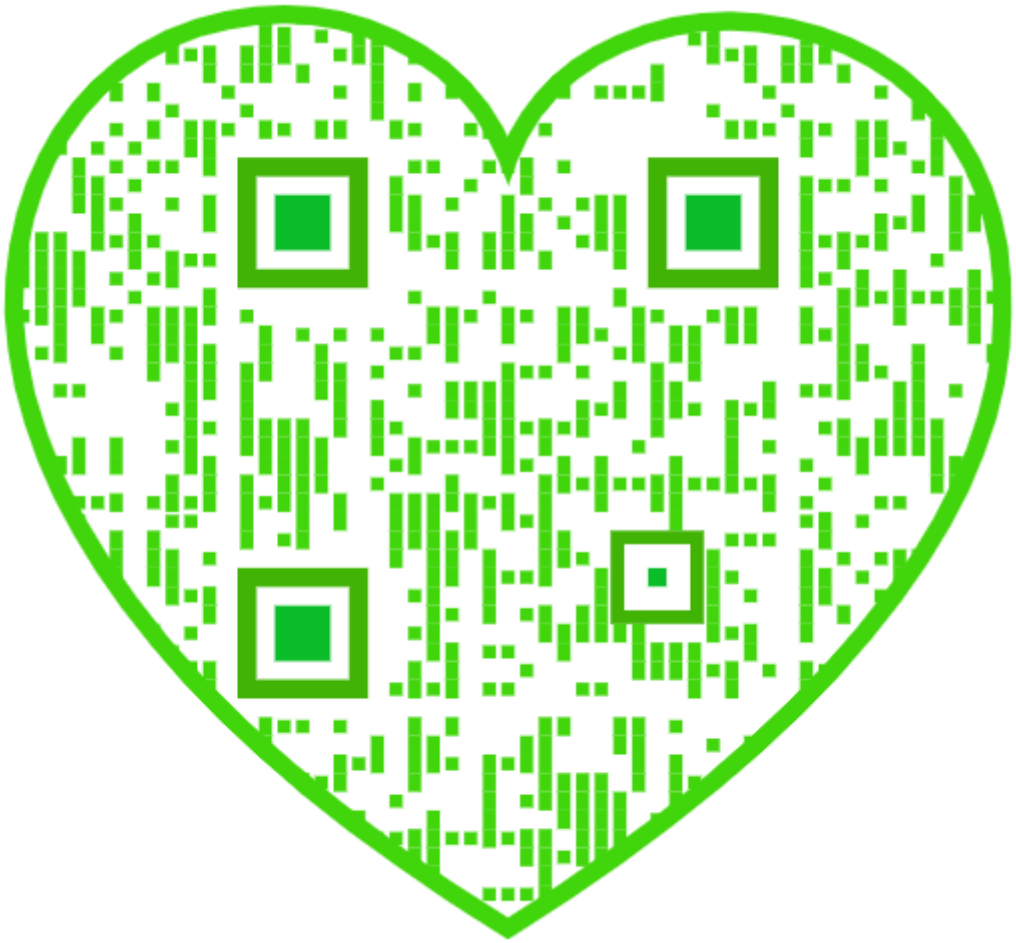

Miscellaneous.

Foreign Correspondence.

Glasgow, Jan. 30, 1851.

The Atlantic—Screw Steamers—Flax and Cotton, &c.—We have little news connected with your department that is not confined to and connected with the Great Exhibition, which you will find in the ordinary newspapers. My opinion is, that the London people exaggerate the probable influx of strangers. One calculation says, that there will be two millions of visitors from foreign countries and five millions from the provinces. Divide the first number by four and the latter by two, and I think the reality will be realized.

As much anxiety has been felt in New York, and your side generally, regarding the Atlantic, I may state that the accident was very serious in the circumstances, but the ship seems to have sailed well to eastward in a very heavy sea. As a kind of rivalry exists regarding these steamers, I may mention that some people here always represented your machinery as not strong enough for the work. That was the point at which they stickled; I take notice of it without any personal knowledge of your steamers, never having seen them. On the other hand, the screw principle seems getting into favor, and orders for new steamers, with screw propellers, fitted for sailing purposes are abundant. These new lines from this country are Plymouth to the Cape of Good Hope, with the intention of extending them to Australia, Madras, probably Bombay and Calcutta; the line to Rio de Janeiro; that from Singapore to Sydney, falling into the Overland Mail route from the East. The line through the gut of Gibraltar to the Mediterranean ports, giving a splendid summer tour by Genoa, Malta, Naples, Palermo, Constantinople, Smyrna, and home, for the cost of good living on shore. Two other lines, viz., to Charleston and New Orleans.

The greatest works out of the country, talked over here, are the adaptation of railways to the improvement of the British North American Provinces and Hindostan, and the re-opening of the old great canal of Egypt from the Mediterranean to the Red Sea. That last work would be a splendid enterprize for us. I think it will be done ere many years pass over.

As you are interested in the patented improvements in spinning and weaving flax with cotton and flax with wool, I assure you they are quite successful in proportions of one-third flax. Two-thirds flax are being tried, but I don't know the results of that.

New gas works for an Irish town are to be built on the gas from water principle. They expect the gas at one shilling per thousand cubic feet; I pay five shillings, in Glasgow, for a large burner. I am told not to despair of an opportunity, in 1851 or 1852, of erecting a small machine and producing gas on the premises, from water, for one shilling or less per thousand feet. **.

(For the Scientific American.)

Hydrogen---Benzole.

Noticing that the press continues to publish statements carroborating Paine's declaration that hydrogen can be catalyzed by passing it through turpentine, and noticing that a large proportion of the community give full credence to his alleged discovery, while another portion are utterly incredulous, and many others know not what to think, I feel desirous of aiding in the settlement of the question, by calling attention to a few facts.

And, first, in regard to the catalysis of hydrogen; any one of ordinary ingenuity can satisfy himself with but little trouble and expense, that it is all a mistake.

Your scientific correspondents, Mathiot and Foster, must have been unpardonably careless in conducting their experiments, or they would have noticed that the whole illuminating power of hydrogen, treated as above, depended on the presence and combustion of turpentine vapor. All that is necessary to convince any one of this, is to note the odor of the gas as it issues from the burning tube before ignition. In every case, where there is increased luminosity, there is present the unmistakeable odor of turpentine. And although Mr. Mathiot alleges that the result is the same, whether you cool down the turpentine by a freezing mixture, or heat it with a lamp, it is *not* the same. To produce anything like brilliant illumination, it must be quite hot. If it be at all cool the flame will differ but slightly from that of pure hydrogen, By substituting a liquid of a more volatile nature, as phosgene, the result is, with the same degree of heat, a much more brilliant light. These facts I have fully tested by experiment. The trial is easy—let doubters satisfy themselves. The turpentine, moreover, *does* lose weight in the operation. Nothing but carelessness or want of accuracy would lead to a different conclusion.

A Mr. Mansfield, constructed, last year, an arrangement for simply forcing *atmospheric air* through an exceedingly volatile hydro-carbon, known by the name of Benzole. He succeeded in producing, by this means, a brilliant gas light, due, of course, to the vapor of benzole. Doubtless, if hydrogen were used instead of air, the light would be still more intense. Perhaps Mr. Paine slily uses some such liquid instead of turpentine, or in connection with it. Or, possibly, those mysterious hollow wires could unfold the mystery, by leading to the hiding place of veritable carburetted hydrogen.

J. T.

Railway Car Wheels.

Messrs. Editors—I believe that the speed of a train of cars is more or less arrested in passing over curves of different degrees of abruptness, and this is no doubt owing to the axles of the passenger or freight cars, and those of the bearing-wheels of the locomotive being immovably fixed in their respective wheels. In turning a bend, the outer wheels of a train have the greater space to go over, and the inner ones the lesser; but at present the inner wheels are compelled to revolve as often as the outer ones; and thus the inner wheels, in the course of rounding a turn, are dragged over the rails the difference of space. It follows, then, in addition to the loss of speed under these circumstances, that railway axles are much strained, and probably somewhat twisted, daily; and thus passenger-cars may be continually liable to break down—as lately happened to a running car on the Western Railroad.

Would it not be an improvement to have at least one wheel on each axle revolvable on the axle? The inner wheels would then, on curved parts of the road, have liberty to partially "mark time," while the outer ones were making the longer detour.

I have not learned whether it is considered dangerous to have railway axles attached to the cars in the same stationary manner as the hind axle of a common wagon, with independent wheels. W. B.

Old Cambridge, Mass., Feb. 14, 1851.

[We do not see how a separate axle for each wheel could mend the matter—we believe that it would increase the tendency to run off the track. A separate axle for each wheel was patented by Robt. Stephenson, in 1825, but never came into use after locomotives commenced running. Wheels revolving on their axles would not answer at all.—[Ed.

Write Plain.

Correspondants should write in a plain clear hand, so that every letter may be known by headmark. No blurred letter should ever be sent to an editor. When the author is not present to read the proof, the copy is the only guide, and a single misshapen letter often spoils the correctness of a good article. It is not likely that any one can know so well, what is correct as the author, he therefore should be careful. We dread making blunders, and like to have everything correct.

The worst piece of handwriting that we have ever seen, is an official copy of a patent now before us from the Patent Office. It should not have been allowed to go beyond the precincts of its walls—we would not have paid for it for our use. A young man from this city sought the office of a copyist in the Patent Office this winter—one of the plainest and best penmen in the world—he was received in a very uncourteous manner. Incompetency is sometimes a passport to office, but we hold it to be the fundamental democratic principle to employ the best and ablest men in public offices.

To our correspondents, we say, "write plain," take time. It is not beautiful writing, but plain we want.

Prussic Acid, Hydrocyanic Acid.

This occurs in the kernels of most stone fruits, the peach, plum, and almond, and also in the leaves of the laurel and some other trees. It is known at once by that peculiar taste and smell which the kernels of these stone fruits have when bruised. The quantity which exists in these substances however, is not sufficient to render them poisonous, unless we eat or drink more than we would choose to do. The acid in its pure state is extremely volatile, so that there is almost equal danger in smelling a phial of the acid, as in taking a small quantity of the contents. Its action upon the system is immediately to paralyze the nerves, and thereby to occasion death as rapidly; no pain however attends its exhibition, as it does not kill by corroding the coats of the stomach, as is the case with the acrid poisons. Its volatility however is so great, that if it do not occasion death within a few minutes, it does not act at all, but is entirely evaporated. Its antidote is ammonia, though sudden and violent effusion of cold water over the head and back is considered preferable. Cyanogen and hydrogen have no direct mutual action, but by the action of certain acids on the metallic cyanurets, hodrocyanic acid is formed by double decomposition.

Cannelton Cotton Mill.

At Cannelton, Indiana, on the Ohio river, there has recently been erected a large cotton factory, built of hewn sandstone, taken from a quarry a few yards distant from the site of the mill. The building is 200 feet long, 60 feet wide, and five stories high. It has two beautiful towers in front, 100 feet high, and it has a stone chimney 100 feet high. The machinery consists of 10,000 spindles, with preparatory carding and cleaning machinery, and there are 400 looms. The building, we believe, was erected under the superintendance of C. T. T. James, Esq., now elected Senator from Rhode Island. The operatives have been selected from the best factory hands in the Eastern States. No difficulty has been experienced in getting plenty of them. It is believed that goods can be manufactured far cheaper in the West and South than in the Eastern States. The eastern manufacturers must depend upon improved machinery to keep their own. Two other factories are projected at Cannelton.

Errata---Steam Engine.

In No. 14, this Vol. Sci. Am., there are engravings and a description of "Milner's Patent Cut-Off." An error was committed in the description. It is this: F is a rock shaft with "a crank at both ends." Now, were it so constructed, the cut-off and exhaust motion would be firmly united by the two small cranks and connecting link, L, and a breakage must necessarily ensue. Now F and F′ are rock *shafts*. They look like one shaft, only as they both work in one bearing in the centre of the cylinder, but F′ is worked by rock shaft D and exhausts, and F is worked on the other side by rod V, to operate steam valves.

Readers will please bear this in mind.

A remarkable fine piece of glassware has been manufactured at Paris, for the great exhibition. It is a very large decanter, blown from very pure and clear material, and sufficiently capacious to allow three persons of a moderate size to sit inside, round a table three feet four inches in diameter, the height of the decanter from the bottom of the level of the mouth is ten feet, and the circumference at the widest part 30 feet. The stopper weighs thirty-two pounds, and the whole decanter 1,388.

Mustard.

Prior to the year 1720, there was no such luxury as mustard in its present form at our tables. At that time the seed was coarsely pounded in a mortar, as coarsely separated from the integument, and in that rough state prepared for use.

The Atlantic is Safe.

The Africa arrived on Saturday evening, and brought news that the Atlantic was safe. We feared otherwise, and cannot express our gladness for the safety of her passengers and officers and crew. The news flew through the city quick as the electric spark, and there was a universal burst of rejoicing. The Atlantic broke her shaft, when she was half way on her voyage and only 800 miles from Halifax. She put back to Britain and arrived at Cork, Ireland, on the 22nd of January. She was only out 24 days altogether.

Messrs. Editors—The article on Ocean Steamers and their Boilers, in your last paper is well timed, particularly that part relating to the prevailing custom of indulging in censorious strictures on the qualities of steamers of home construction, by those whose ignorance finds a parallel only in their pretentions. For the benefit of all such, perhaps your benevolence will prompt you to give publicity to the letter found on page 93 of my Treatise on Marine and Naval Architecture, from an eminent ship builder of this city, it would be well for the commercial world if it were embossed in letters of fire on a horn of the moon, that the world might know the reason why American steamers average 12 days in crossing the Atlantic instead of ten. It is not my purpose to enter upon a disquisition of American steamers (particularly at this time) having already given a synopsis of the subject in the 10th chapter of the work referred to. Yours truly,

John W. Griffiths.

[We will publish the letter referred to by Mr. W. Griffiths, next week, and also present from time to time with his consent, extracts from his splendid work.—[Ed.

The Volcano at Salt Lake.

"This volcano is a plain of mud, and on the borders of the lake. It is composed of mud, covers several acres, steam and water escaping from half-a-dozen apertures. The mud is raised up into cones, the highest not five feet from the general surface. They are terminated by tubes, some hardened and lined with crystals of sulphur and other substances. one of the cones throws steam and water ten or fifteen feet into the air. It escapes rapidly, and with a sound resembling the escape of steam from the pipe of a small steam engine; and it ejects hot and cold water at intervals. One cauldron, some four feet across, boils up until it overflows, then sinks several feet, and again overflows. Nothing is seen but a mass of foam; the water is strongly impregnated with sal-ammonia.

Silvered Glassware.

The Boston Transcript states that Messrs. Sumner, of that city, have recently received from London a new style of silvered glassware, which promises to take precedence of the Bohemian and other fancy glasses. The silvering is indestructible, being coated over with glass, and is of a vivid brilliancy, that can never be tarnished or impaired. Dishes, vases, and pitchers of this ware make a more brilliant display than the same articles of pure silver, however highly polished.

Height of Men.

Professor Forbes states the Irish to be taller on the average than either the English or the Scotch. Having measured a thousand of each nation—English, Irish and Scotch,—he gives the following as an average height of each:—English, 68½ inches; Scotch, 64⅝; Irish, 70; and the age of each twenty-one years.

[We have seen the above in no less than ten different papers. It shows how people grab without examining. The Scotch are 6 inches shorter than the Irish by the above—all nonsense, and Prof. Forbes, never made any such statement, and we can prove it.

Georgia.

The Athens Mechanic contains the call for a mass meeting of mechanics, to be held at that place, July 4, for the perfection of an organization throughout the state.

The State Library of New York contains over 25,000 volumes, nearly half of which are law books of great value. The collection is valued at $10,000.

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On the Cicada Septemdecim.

This destructive insect is not a true Locust, but derives its popular name (seventeen year Locust,) from its fancied resemblance to the Locust of the East, which belongs to the family of grasshoppers, (Locusta.)

The Cicada Septemdecim appears in June every seventeen years. When they emerge from the ground they are grub-like in form, destitute of wings, and covered with a tough shell, a proper and convenient coat, that effectually protects them while in their earthly abode. The evening and early morning hours are best suited for them to undergo their change from the grub to the winged form; and accordingly as soon as the sun disappears, they might be seen creeping from the earth in countless numbers, crawling to the nearest tree or shrub, which they climb until they reach a convenient spot to grasp firmly. There, with their heads always upwards, they await the change, which begins by a slit opening in the back of the shell, and the fly gradually draws itself out, the body enlarges, the wings expand, and the creature assumes new life and energies, though it always continues heavy and sluggish. They live in the winged state about three weeks before they deposit their eggs, subsisting on dew and moisture found on the leaves of the trees. The female has a strong and curiously contrived piercer, with which she carefully slits the back of the twigs of trees and shrubs, and deposits her eggs in pairs, side by side, but separated by a portion of woody fibre, and placed obliquely, so as to allow one end to point upwards; from ten to twenty eggs are deposited in this slit. She then removes a little distance, and makes a new nest; when a limb is sufficiently stocked, she removes to another, until her store of eggs is provided for, when she becomes exhausted, falls to the ground, and soon dies. One female will deposit four or five hundred eggs. The eggs require forty-two days to mature in the branches of the trees; they then burst the shell and appear a minute fac-simile of the larval state, requiring but a few moments to stretch their limbs and prepare for labor, before they unloose their hold of the twig on which they had been deposited, and fall to the ground, when they immediately disappear in search of food, which they find in the roots of the parent tree. When first hatched they are very small and white, but soon change to a yellow brown. They exist in separate tribes, occupying a different section of country, making their appearance in different years, but invariably after the same interval of time. For a year or two before and after the appearance of the main body a few scattered individuals will generally be found.

Their favorite trees appear to be the oaks and fruit trees in general; avoiding the Fir, Walnut and Hickory tribes, though they will occasionally deposit their eggs on them, should no other tree be conveniently near at the proper moment.

From the roots of a pear tree, four hundred and eighty of these insect larvæ were taken, fortunately in time to save the life of the tree; the roots were unhealthy, and bore the appearance of external injury arising from small punctures, and on removing the skin of the bark this appearance increased, leaving no doubt as to the cause of the disease. The larvæ were enclosed in compact cells of earth, with no outlet except that in immediate contact with the roots.

Should a tree on which these larvæ have been feeding be cut down, the insects perish for want of food; and, if carefully searched, the cells that had once been inhabited will be found either containing the decayed insects, or filled with what has gradually been deposited by filtration, bearing strong evidence that these larvæ never leave the tree on which they were originally deposited.

[The above is the production of Margaret H. Morris, of Pennsylvania.

Some very interesting experiments have been made with Oregon Coal in England. It burned well and has been pronouuced equal to the English in every respect.

Steaming for Hydrophobia.

A M. Buisson has writen a treatise to the Paris Academy of Sciences, detailing the manner in which he was cured of hydrophobia. He is a doctor and had been called, in 1835, to visit a woman who, for three days, was said to be suffering under this disease. She had the usual symptoms, constriction of the throat, inability to swallow, abundant secretion of saliva, and foaming at the mouth. Her neighbors said she had been bitten by a mad dog, about forty days before. At her own urgent entreaties she was bled, and died a few hours after, as was expected.

"M. Buisson, who had his hands covered with blood, incautiously cleansed them with a towel which had been used to wipe the mouth of the patient. He then had an ulceration upon one of his fingers, yet thought it sufficient to wipe off the saliva that adhered with a little water. The ninth day after, being in his cabriolet, he was suddenly seized with a pain in his throat, and one still greater in his eyes. The saliva was continually pouring into his mouth; the impression of a current of air, the sight of brilliant bodies, gave him a painful sensation; his body appeared to him so light that he felt as though he could leap to a prodigious height. He experienced, he said, a wish to run and bite, not men, but animals and inanimate bodies. Finally, he drank with difficulty, and the sight of water was still more distressing to him than the pain in the throat. These symptoms recurred every five minutes, and it appeared to him as though the pain commenced in the affected finger and extended thence to the shoulder.

From the whole of the symptoms, he judged himself afflicted with hydrophobia, and he resolved to terminate his life by stifling himself in a vapor bath. Having entered one for this purpose, he caused the heat to be raised to one hundred and seventy degrees thirty six minutes Fahrenheit, when he was equally surprised and delighted to find himself free of all complaint. He left the bathing-room well, dined heartily, and drank more than usual. Since that time, he says he has treated in the same manner more than eighty person bitten, in four of whom the symptoms had declared themselves; and in no case has he failed, except in that of one child, seven years old, who died in the bath. The mode of treatment he recommends is, that the person bitten should take a certain number of vapor baths, (commonly called Russian,) and should induce every night a perspiration, by wrapping himself in flannels, and covering himself with a feather bed; the perspiration is favored by drinking freely of a warm decoction of sarsaparilla. He declares, so convinced is he of the efficacy of his mode of treatment, that he will suffer himself to be inoculated with the disease.

For the Scientific American.

Sub-Marine Telegraph Under the Atlantic.

Under the above heading is a communication, in No. 5, Vol. 6, from H. L. Stuart, engineer, in which he lays down a well arranged plan for the electric union of the Old and New World. He states that proposals had been made to construct a line between England and Ireland, upon the plan alluded to, and if successful there, proposals in due form would be made to capitalists and to the Government to lay down the Atlantic line. It seems to me that one difficulty of an almost insurmountable kind would occur, of which nothing is said in the above plan. I refer to the action of ice bergs. Every spring immense numbers of these huge bodies come floating down to a lower latitude than that proposed for the line of the telegraph. As all are aware, their depth is frequently great, often over 1,200 ft. Lyell tells us that immense blocks of granite and other hard rocks are frequently frozen into their under surfaces, and that they often are aground, as one can readily believe, when he reflects upon their depth. Imagine one of these massive bodies to strike the ground somewhere along the proposed line of wire (which, it seems to me, could hardly fail to happenevery spring). Would not the raking and grinding that would then and there occur, be sufficient to snap the stoutest cable that could be laid down, or, at least, raise such a "rumpus" with its gutta percha covering as to scatter its load of lightning upon the wide waste of water.

R. S. B.

Attempt to Poison on Shipboard.

The Barnstable Patriot says that a letter has been received in town from Capt. Wm. Loring, of the bark Governor Hinckley, in which he says that when ten days out of New York for London, an attempt was made by the cook to poison the officers and passengers on board his bark, by introducing some poisonous substance into their coffee. The captain and mates, the captain's daughter and two or three passengers, partook of the coffee but not in sufficient quantities to prove fatal to any one of them. They were immediately taken with vomiting, and remained sick for some time from its effects, but recovered for the most part before reaching London.

[Now all this might have happened without the least attempt on the part of the poor cook. If coffee be kept hot in a copper vessel for five or six hours, or in a tin kettle with a copper bottom, it will dissolve part of the copper and become a poisonous drink. The above all might have occurred from this. A case of the same kind came under our own notice, six weeks ago. The vessel was tin with a copper bottom; strong coffee was kept in it for four hours, simmering on a stove, after which the liquid became of a darkish green color, coppery in taste, and poisonous in its effects. No trace of the copper was observable at the end of the first hour, to the taste or to the eye. Let those who read this not forget to remember it, and also tell their neighbors about it. Coffee should not be kept in any other metallic vessel than tin or silver.

Evaporation and Condensation in Engines.

Evaporation seems in all cases to convey electrical matter into the atmosphere, on the other hand, when steam is condensed into vesiculor vapor, or into water, the air becomes negatively electric. The electric state of the atmosphere being, no doubt, of the first importance in regard to the phenomena alluded to.

The laws relating to evaporation and to condensation, and to the carrying property of matter, when combined with caloric, evidently perform a very prominent part in the operations of nature and of art. The engineer could no more work efficiently the giant locomotive to drag us over the surface of the earth with the velocity of the whirlwind, unless aided by the cooling property exerted in the evaporation of fluids, than he could do without the highly elastic power of the steam that is generated. His boiler would soon become red-hot, and would give way under the pressure, but that the all-absorbing capacity for caloric exhibited by the liquid element, which combines with and flies off with it during its gradual conversion into steam, and at a comparatively low temperature robs the furnace of its energy.

It is the difficulty of bringing such cooling power to bear efficiently and conveniently in the various schemes for obtaining motive power, whether by the aid of gunpowder, or by that of carburretted hydrogen combined with atmospheric air, or firedamp, whether by the use of what is termed the hot products of combustion, or by the many other projects of a similar kind that have at various times been suggested, that must form a serious, if not fatal obstacle to their employment, or at all events, to their ultimate general utility.

Good for the Logwood Business.

Port wine has taken a rise in England, unprecedented since 1823. The rise is owing to a failure in the vintage. The intelligence need not effect the business of our home producers of the article, who give us the stuff, "warranted pure," in any quantities, concocted of sour beer, logwood, elderberries, alum, and plumb juice. Drinkers of the article have only to encourage domestic industry.

American Vinegar in England.

The London Correspondent of the Philadelphia North American notices the receipt at the port of London, of 100 casks of vinegar from Boston, and thinks that New England cider and vinegar carefully made, will, at no distant day, be largely imported into Europe. He states that the English vinegar contains poisonous chemicals which are very injurious to the health, and that the cider sold in London is not equal to the purest kind made in this country.

The Telegraph in Mexico.

A contract has been entered into by the Mexican Goverument with Wm. George Stewart, Esq., the Mexican Consul at New York, and, Senor Juan de la Granja, of Mexico, to build a line from Vera Cruz to the City of Mexico—a distance of three hundred miles—on the understanding that it will be in operation by the first of May next, as far as El Ojo de Agua, a distance of one hundred and twenty miles from the latter place. Another line will soon after be built between Acapulco and the City of Mexico. When both are completed, there will be magnectic communication between the Atlantic and the Pacific. These important projects will be entered upon immediately, and Mr. H. F. Makepeace, who was for a long time connected with the Albany and New York Telegraph Company, as chief operator, will sail in the bark Braxileiro, Captain Marsh, for Vera Cruz, with the necessary wire, instruments, and implements for the work. He will take out several operators with him.

These telegraph lines will be of great convenience to this country, and will, no doubt, be liberally patronised by the merchants of the United States and California. As far as communication is concerned, New York will be within ten days of San Francisco. We also learn that the road from Acapulco to the City of Mexico will be shortly improved, and a line of stages built for the purpose of conveying passengers between those places.

Sterine Candles.

Sterine—or stearic acid, as it is called by the chenists—is a product of the animal fats and oils, and is obtained by a process which consists essentially in saponifying these bodies, —that is, converting them into soap,—decomposing the soap by means of an acid, and subjecting the resulting fatty matters to powerful pressure, by which the thinner parts are squeezed out from the sterine, which remains in the press. Sterine is made, in this country, almost exclusively from lard, which furnishes about two-sevenths of its weight; the remaining five-sevenths being manufactured into lard oil.

Lime is the material used to saponify sterine, according to the old patent process of Gay Lussac, the celebrated French chemist; the process being effected by several hours' boiling; and the decomposition of the lime-soap is then effected by sulphuric acid.

The cakes of crude sterine—about 5,000 lbs. at a time—are then melted and saponified; the lime soap decomposed; the sterine acid washed and cast into slabs or cakes of one by two feet in dimensions, and two inches thick. These are then pressed, cold, in powerful hydraulic presses, which squeeze out a portion of oleine—the red oil of commerce. They are pressed a second time in the hot presses, which are still more powerful than the others. They are afterwards steamed, drawn off into pans while hot, and bleached, strained through cloths into tin pans, and when it cools, forms blocks of a beautiful white wax appearance.

Death of a Distinguished Astronomer.

Professor Shumacher, the astronomer in the Observatory at Altona, died on the 28th of December, in his seventy-first year. For many years he has been before the scientific world as the "Astronomische Nachrichten." He was a man of great scientific acquirements, and many scientific undertakings were completed by him, such as measuring by the government the degrees of longitude from Copenhagen to the western coast of the Jutland, and the degrees of latitude from Skagen to the frontiers of the Kingdom of Hanover—also for the English government the measure of the difference of longitude existing between the observations of Greenwich and of Altona. He was a diligent and accurate observer, one of his latest labors being connected with Encke's planet, Astreæ.

The Duke of Wellington is 81 years of age, and wears no spectacles.

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New Inventions.

New Way of Securing Pitchfork Tines.

Mr. Geerge Ransom, of Chester, Middlesex, Co., Ct., has invented and taken measures to secure a patent for an improvement in the construction and mode of securing the tines of pitchforks. The plan is to have the metal shank of two tines made with an oblong slot in it, and to have a screw cut upon its outside fitting into a socket in the handle. A collar or ferrule, having a thread cut on its interior, fits over the metal shank, which by fitting around and working like a nut on the shank, works up close to the shoulders of the tines, making the slot spoken of small or large. To make a four tine fork, a set of double tines which are formed with a square shoulder, is inserted in the slot, with the shoulder fixed firm in the same, when the ferrule is screwed up, the slot closed, and the tines secured firmly by the said ferrule, into the socket of the handle. For a three tined fork, the centre tine projects from the middle and the metal shank with the slot in it, is just a continuation of the tine, and made like the other we have described. The metal shank with a slot in it, and a screw to be secured by the collar or ferrule, are the new features of this improvement.

New Cloth Folding Machine.

Mr. J. Birkett, of 180 Essex street, this city, has taken measures to secure a patent for an essentially new improvement in machines for folding and measuring cloth, of which we think not a little highly. It is the most simple machine of the kind, we have yet seen. It consists of a table hung upon a lever with a weight at the end of it, to press it (the table) upwards; on this the cloth is folded or laid down by two arms with a broad blade on each, which have a vibratory motion moving in an are by a simple crank motion. These arms extend up from the side and across the top of the table, in such a manner, that at the end of their stroke, each blade takes a lap of cloth and pushes it between the table and a stationary lip which holds it down in the fold on the table. The cloth is fed in from a roller above, and the vibratory arms spoken of, lay the cloth in folds just in the way that a person would stretch out one hand to lay a fold on the table, to which the length of the arms is able to stretch, and then lap in the other close to the breast. The folding motion is a parallel one, derived from a rotary shaft and is altogether exceedingly simple.

Porter's Self-loading Gun.

Mr. Porter, residing at or near Memphis, has constructed a most novel and curious fire-arm, called the "Self-loading Gun," in which the simple operation of "cocking" to shoot by the assistance of valves, or equivalents, separates from the magazine attached to the gun the materials for each load—loads the gun. It is capable of being discharged forty times in a minute, and shoots a ball with tremendous force, and with usual exactness. The editor of the Memphis Enquirer, after careful examination and repeated experiments, is satisfied that nothing which can bear comparison with it in efficiency has been discovered, and that no "revolver" of any kind approaches it in destructiveness, or in the adaption of the means of safety against accidents in their use.

Steamboat Coal.

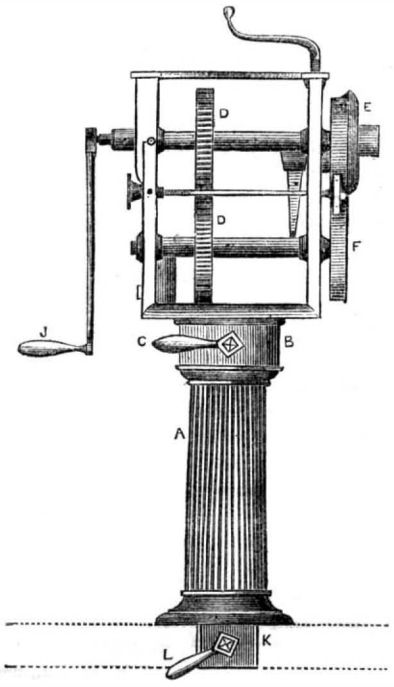
Messrs. Nathan Thompson, Jr., and James Thompson, engineers, have made careful experiments with different kinds of coal in the Collins' line of steamers, and have reported in favor of what is termed the "Dauphin Rattleing Run." It has a high evaporative power, ignites quickly, burns with a clear bright flame, leaves little soot behind, and does not cake. In comparison with the Maryland Mining Co.'s Coal, it requires 75 per cent. less labor of the fireman to attend to it.

We see it stated in some papers that a young man in St. Louis, has discovered a new way to make gas from the atmosphere. This light when it comes out will astonish the donkeys.

Improvement in Tinsmiths' Wiring Machines.

This is an improvement on the posts of Wiring Machines, by Mr. A. W. Whitney, of Woodstock, Vt., which makes the machine more convenient and useful. All the parts are the same as the one illustrated in No. 35, Volume 2, Scientific American, except the post or pillar, which is made to answer a whole set of tinsmith tools. Fig. 1 is a side elevation. Fig. 2 and 3, are sections.. A is the iron holder pillar, it is secured on the bench represented by dotted lines. The projection, K, on the lower end of the post is fastened in a socket in the bench by a screw,

Fig. 1.



L. E F are the two steel faced rolls; D D, are the two wheels, J is the handle; B, is the shoulder collar; C is the handle to unscrew the machine and to disconnect it from its pillar, A, and fig. 3 shows the lower projection of the frame of the machine, which is a round fluted post fitting into the outside collar, B, of the pillar, A. It enters the collar, B, which is its socket, and the set screw, C, fastens the machine by entering between the flutes, and retaining it firmly in its socket. This also allows the machine to be turned round in any direction for convenience and set with the

Fig. 2.

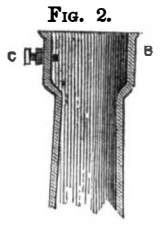


Fig. 3.

screw, C. This is the new arrangement, and it will be seen how easily one pillar answers for different machines, without disconnecting it with the bench.

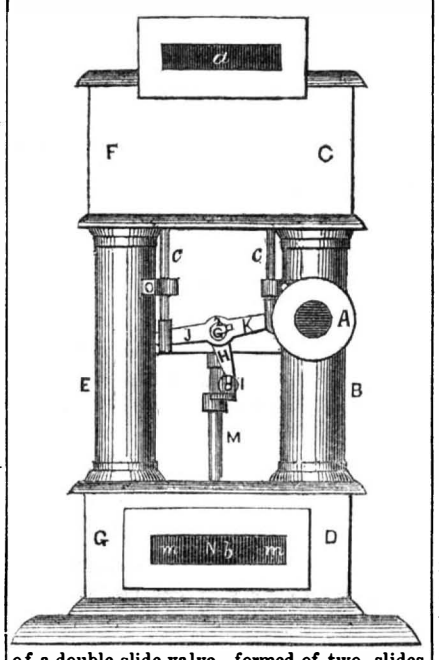
More information may be obtained by letter addressed to Mr. Whitney.

Balance Slide Valves.

This is an invention of Mr. William Lawton, No. 139 Avenue D, this city, who has taken measures to secure a patent for the same. Fig. 1 is a front elevation of the steam and exhaust chests, with pipes connecting them, and valve gear attached. Figure 2 is a detached front elevation of the lower steam and exhaust chests with the front cover removed, showing the interior chamber and the valves in their working position. Figure 3 is a transverse section taken at the line O O, fig. 2, and viewed in the direction of the arrow. The same letters refer to like parts.

This invention consists in the employment

Fig. 1.



of a double slide valve, formed of two slides connected by an arm between them, which double valve is applicable for the purposes of inlet and exhaust. A is the branch pipe from the boiler, connecting the pipe, B, to steam chests C D. E is a pipe for the exhaust, connecting the two exhaust chests, F G. These chests are separated by partitions; *a* is an upper and *b* is a lower inlet and outlet port, which may be suitably connected to the top and bottom of the steam cylinder. The slide valves are in the chests, and may be worked either vertically or horizontally. The valves in the upper chests are moved by a vertical up and down motion, while the valves in the lower chests are moved by a horizontal motion—out and in. The valves, fig. 2 and 3, only show the out and in motion of the lower valves. The manner in which these are worked is peculiar,—H is a rocking arm, which gets its motion from a rod connected to the main shaft. This arm gives a vertical motion to the upper valve rods, C C, and gives an oscilating motion to a vertical shaft, M, which, as it were, swings in its seat; G^2 is a rocking shaft placed horizontally, transversely, between the pipes, E B, fig. 1, and supported in proper bearings; a rocking beam, J K, connects this shaft to work the upper valves vertically, and

Fig. 2.

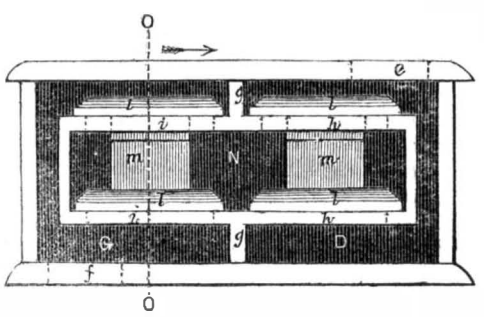
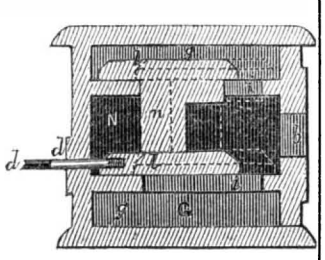


Fig. 3.



a beam of the same kind is connected horizontally to the lower valves (not seen) in fig. 1; it will, therefore, be observed that two motions to work the valves are derived from the rocking shaft, G^2, driven by the oscillating arm, H I. The lower chests, D G, are made as follows: the steam passing down the pipe, B, is admitted through the aperture, *e*, to the chest, D, which contains an internal chamber, N, of such a size as leaves a passage way around it, separated by partitions, *g g*; *f* is the exhaust passage. The interior chamber, N, is completely enclosed from the chest surrounding it, excepting having communication by the valve openings or ports; *h h* are the upper and lower steam ports; *i i* are the exhaust ports. The area of the valve openings should be as great as is admissible, and no smaller than is necessary for the lap of the valves. Each valve may be called *double*, that is, it has two slides, *l l*, connected together by what may be termed "a block," *m*. One slide, *l*, moves on the face in the inside of the interior chamber, N, and the other on the outside in the steam chest, D. Both the exhaust and steam valves are exactly alike, therefore the description of one will answer for the other. The rod, fig. 3, *d d*, is for working the valves in the chests, G D, horizontally.

Steam entering the chest, D, through the aperture, *e*, presses on the top of the upper slide, *l*, and on the lower also, thus balancing the pressure, and when the port is open, the steam presses inside of the chamber, N, reversely, but equally in the same way on the sides, consequently they experience equal steam preasure on their surfaces. When the valve in the chest, D, exposes its openings, *h h*, the steam enters through them.

Figure 3, by the dotted lines, shows the motion of the slides. It will be understood that the steam cylinder is in communion only with the interior chamber, N; the chests—both steam and exhaust—butt with a close joint against the inner chamber at the front plate, fig. 1; *b*, in this figure, shows the passage between the chests and inside chamber. The upper chambers may be arranged the same way. The steam and exhaust valves at one end, are opened and closed alternately, and at opposite times, to the valves at the other end of the cylinder.

By the above description we believe that a very correct understanding will be obtained of this invention, especially by our steamboat engineers. We must say that we think a great deal of this invention. We have never seen slide valves constructed, arranged, and operated the same way. Mr. Lawton has taken measures to secure a patent.

The Patent Office Building.

The National Intelligencer of the 14th inst., replies to the articles we have published respecting the contemplated appropriation of the Patent Office Building to the use of the "Department of the Interior." It comes forward to advocate the measure (as might be expected) recommended by Mr. Stewart. It endeavors to prove that the Patent Office Building was not originally designed for the exclusive use and accommodations of the Patent Office, (this we did not expect) and quotes the law to prove its point, which is, that "there be erected on some appropriate site under the direction of the President of the United States a fire proof building with suitable accomodations for the Patent Office." "This act," it says, "did not declare the building to be for the exclusive accommodation of the Patent Office." It calls our charges flippant; if ever there was a more flippant argument to appropriate the Patent Office Building for any other purpose than the business of the Patent Office, the quotation above is one of them. Does the law mention a second party for whom the office was built? No. But the Intelligencer sees that it may mean the Department of the Interior, and an elastic commentator may make it mean anything.

All the arguments and figures of the Intel ligencer fail to convince us—as its principal object is to prove—that the Patent Office building was ever designed, by any act of Congress, to be devoted to any purpose but that of Patent Accommodation, and the attempt now made by the Secretary of the Interior and his advocates, is the first of the kind ever made. It is true the Intelligencer says, "it is not intended for permanent use," but it is very easy to make such pretensions until the said Department gets into it, and then the Intelligencer, which can find an argument for the Department of the Interior in the original law, will be able to find a far stronger one for remaining in the office, even when it is demanded by the business of the Patent Department. If the Intelligencer had read our article attentively, it would have seen that this was the drift of our arguments. We said, (page 157, 2nd column) that if the Patent Office building was absorbed now, it would be difficult to get it when required, as it would soon all be, for the wants of the Patent Office. For years the Commissioners have been complaining that they have not had room. Why? Because the building has been appropriated to other uses than those originally intended by the projectors of the Patent Office Building. We will have something more to say upon this subject next week, as we have no more room to do so at present.

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Scientific American

NEW YORK, FEBRUARY 22, 1851.

Mechanical Hobbies.

Almost every man has some foible, and it is a good thing that it is so. The man who never has an aspiration after things better, who never dreams nor doubts, is a poor mortal. He may do good in the world, to be sure, but it is only in a negative manner, like the rock that is chiselled by the artist—it is the delineation of a man, but, after all, it is only a stone. Give us a man with life in his soul—some vigor of thought and action about him, and although it be displayed in the most whimsical hobby, still we like him far better than the dull, ever-behind, thoughtless, hobbyless mortal, who has no thought of better things, and to whom the verb *to be* is a fathomless, dark nonentity.

We might speak of various hobbies, but we only wish to say a few words about mechanical ones. That was a most clever fellow of a Greek who could shoot peas through the eye of a needle—it was his hobby; it ended with himself, and that proved it to be a foolish one. Hero, of Alexandria, had a number of mechanical hobbies, but who dare say they were not more than trifles. His water blast, his experiments in steam, are living mementos of their author, who has slept in the grave for thousands of years. It is rather a common, wise, see-saw practice for people who cannot give a single reason for their opinions, to shake their heads at those fools, as they call them, who are possessed with the hobby mechanical. Dean Swift called Newton "a glass grinder, and maker of spectacles;" and he no doubt thought that his own most crazy reveries were Divine inspirations in comparison with Newton's mechanical contrivances—the embodiment of his thoughts in tangible forms and movements.

In every age there have been men with mechanical hobbies, and in every age to come they will find successors. The spirit we like, the practice we may condemn, at least so far as mere copying is concerned. It is true, that to produce works of art, to give the hand its skill, copying is positively necessary as a primary qualification, but we totally deprecate the hobby spirit which sees nothing beyond, and which strives for nothing better than the "*what has been, or what is.*"

There are two mechanical hobbies which have possessed not a few men for a long time. There is no civilized country without its representatives in the class to which we refer, viz., the perpetual motion and rotary steam engine hobbyists. Within the past six months we have counted six patents granted in our country and England, for rotary engine inventions, happily none for perpetual motions—that being a somewhat reserved branch of patent discretion; but yet, for all this, we hear of a new perpetual motion about every two months. To invent a real perpetual motion—a mechanical one—is a hobby not to be despised, for it shows strong aspirations to do something better than has yet been done, but still it is as foolish a one as that of the Greek who became famous for shooting peas through the needle's eye—it is an impossibility. The rotary engine cannot be placed so low in the scale of hobbies as the perpetual motion, but still we believe that it is a vain waste of time in seeking for something better than the present, by working for the production of something far worse. Perpetual motion will only be discovered when the laws of inertia and gravitation are suspended; and rotary steam engines will supplant cylinder reciprocating ones, only when another form can be obtained superior to that of the round pisten for packing, and for producing as little friction as it does, and this never will be. The form of a cylinder, with its round fitting piston, is the very finest and the only one adapted for distributing the power of steam economically to other machinery. If there is any fact stronger than another, to prove the truth of this averment, it is, that nearly one hundred patents have been granted for rotary engines—not two of which are now in actual operation.

We do not call up this subject to point to particular faults, but to direct the judgment to the consideration of "weighing all things well." It is not possible to enumerate faults neither is it our intention, we only throw out our views on the subject, and that not without cause, for we have perpetual motions presented to us almost every week, and rotary engines as often. A perpetual motion scheme is now before us, and it must have cost its author much time and study, and perhaps some sleepless nights; and yet it is one which is fully illustrated in the Marquis of Worcester's "Century of Inventions." In thus alluding to the principles comprised in mechanical inventions, we hope that we may be the agent of diverting some ingenious minds from a wrong to a right direction, and thus be the means of bringing something useful and enduring out of their *mechanical hobbies.*

The Coal Fields of the World.

No other country in the world is so richly favored with an abundance of coal as the United States of America. There are 124,735 square miles east of the Mississippi river, and 8,397 square miles west of it—this is all bituminous coal, comprising no less than an area of 133,132 square miles. In the State of Pennsylvania there are 437 square miles of anthracite coal. In all Great Britain there are only 8,139 square miles of bituminous coal, and in Great Britain and Ireland only 3,720 miles of anthracite. In British America there are 18,000 square miles of bituminous coal, which, by a most iniquitous monopoly grant, is lying almost as dead stock in the Provinces. Spain is richer in coal than any other nation of Europe out of England—she has 3,408 square miles; France 1,719, and Belgium 518, square miles. Although we have such vast coal fields, we use no quantity of coal at all in comparison with Great Britain. For domestic purpose we have had, and now have, such an abundance of wood, extending nearly throughout every part of our country, that we do not require coal, and will not for many years to come, especially in our northern rural districts. The annual production of coal, in Great Britain, is about 42,000,000 of tons per annum. In our country it is about 5,000,000 per annum—anthracite and bituminous. The production of American coal is becoming greater and greater every year. As we increase in population, the consumption of coal will increase in a greater ratio, for the use of wood is being curtailed year by year, consequently the coal consumption must not only increase with the increase of population, but also to supply the place of wood. Many of our farmers living within twenty miles of New York prefer coal to wood, and use it for fuel, while they have trees standing on their farms.

The coal fields of Britain are finely situated—none in the world can equal them for every purpose, both for ease of transportation and their proximity to iron and lime beds, for the manufacture of iron. Our resources in this respect, however, are but beginning to be developed, yet for foreign shipment, none of our fields, that we know of, are so convenient to the tide-water mark as those of England, but then we don't require them to be. Our great trade, and the one we must first look to, is our inland interior one. Our country is so extensive in area, and so various in climate, that we possess the sources of a great, it may be said, "foreign and domestic trade," within our own boundaries. At present but little coal is employed for locomotives. Wood is almost universally used. If coal was used in the form of coke, a greater amount of coal would be added to our productive list. It will yet come to this, for the forests are fast disappearing to fill the cribs of our iron horses.

The future presents a bright prospect for our coal trade. It was James Watt who said of Glasgow, stamping with his foot, "her wealth lies here," meaning her coal and iron fields. Well, it is just so with our country. Coal fields are more valuable than gold mines—we speak of essential value, for we could live and be lively without gold or silver, but not without coal to boil our tea kettles and warm our toes. Many years will not pass away, until we have railroads extending from the Atlantic to the Pacific, and then there will be lines of steamships running from our far Western States across the Pacific to the Sandwich Islands, New Zealand, and China. All these will form one continuous steam line to Europe, by our Atlantic steamships; and then what an amount of coal will be necessary to keep up the steam.

Until the middle of the 18th century, nearly the whole of the great basin of the Mississippi, the valley of the Ohio, and the western slope of the Alleghany Mountains, constituting the great central coal-field of America, were partially occupied by Indian tribes; and for many years afterwards, this vast region was held to be of so little value, that the acquisition of the coal-fields did not in any respect influence the arrangements between the parties, made at sundry times by William Penn and his family, and subsequently by the proprietaries. By the treaty of 1768, the latter became possessed of nearly the whole area of bituminous coal-land of Pennsylvania, 'for the sum of $10,000!' and about that time the presence of coal in certain places seems to have first become known. But it was not till 1828 that the first cargoes from the Alleghany coal-fields reached Philadelphia and Baltimore. Within the present limits of the city of Pittsburg; in 1775, only a few cabins were standing; but, in our day, three-fourths of a million of tons of coals are annually received there; and the iron manufacture is so great as to confer upon the place the title of the Birmingham of America. Yet, vast as the produce is already in some places, it can scarcely be said to have begun; and it is impossible, to contemplate its gigantic proportions, and its enormous yet almost untouched resources, without being struck with the magnificent field it presents for future enterprise.

The great Pittsburg coal bed, running through the Monongahela Valley, is, in extent, half as large as all Scotland. The great coal product of our country is the anthracite; in England it is the reverse—the bituminous. More than three millions of tons of Pennsylvania anthracite is consumed every year; in England very little is used, and none at all, we believe, for family purposes. Pennsylvania, with her fine anthracite coal fields, has the prescience of greatness within her own bosom—no outward event but that of a natural increase of our population is required to ensure her solid progress in wealth and greatness. The states east of the Alleghenies must always be dependent on her for their fuel. What a change has been wrought in her since the good old days of straight-up-and-down William Penn. A century ago her coal region was a wild, stony country, termed the "Wilderness of St. Anthony," and for seventy-five years after, it was still the haunt of the bear and the panther; but now canals and railroads intersect it, and it is studded with villages of dusky-browed, hard-fisted coal miners, who dig out gold from beneath the rocks, and whose future success in this Pennsylvania wealth it is impossible to calculate.

The coal regions of Virginia are also very valuable, but have not been developed as they should be. Her vast beds of cannel coal will yet prove of more benefit to her than her gold mines. The coal beds of the great Mississippi Valley have scarcely been broached. They will yet form the grand sources of our coke manufacture for our locomotives and the manufacture of iron. The West—the Great West—what an illimitable prospect for thy progress. Without coal we verily believe that our nation never could arise to a very high elevation, either as a commercial or manufacturing one. We would rise to a certain point, and then stagnate for want of meat to send the blood through our industrial arteries. With coal no fears need be entertained about this, but every hope for a steady, sure, and certain progress in every department of national comfort, wealth and power. God has given us a country unequalled by any other for all natural resources, let us not fail to improve and be grateful for such blessings.

A lot of 4,000 sheep has been despatched from Senora to San Francisco, California, to exchange the mutton for gold.

Improvement in Tanning and the Treatment of Hides.

On our List of Patent Claims, this week, there is one of a renew for a new process of tanning, by a Mr. Hibbard of New York. We have seen a number of articles made from leather tanned by this process, and they looked well; whether they possess the enduring qualities of the leather tanned by the old process or not, we cannot tell, but there does not seem to be much that is new, at least about the tanning liquids, nor about the preparatory liquors either, but it often happens that great and good results are obtained by very simple means, especially in chemical processes. The Ohio Cultivator, in speaking of Mr. Hibbard's process, says:—"Mr. C. L. Whiting, of the firm of Vinton, Wright & Whiting, of Licking County, Ohio, exhibited to us, a few days since, specimens of sheep and calf skins tanned by this process; and the quality was such as to fully corroborate all that has been said in favor of the invention. Two of these gentlemen are experienced practical tanners, and they are firmly convinced that what has been claimed for it is true, to wit, that only about one-sixth of the usual time is required for tanning—that the quality of leather produced is vastly superior to any ever before offered in the American markets, including the choicest French and Turkish brands—that a saving of 20 to 25 per cent. of the cost of tanning materials is effected—and that the process is applicable to all kinds of skins and leather, including the heaviest article of sole and harness."

It has been stated that, by this process, the hair is removed from the skins in one-fifth the time usually required; that is, quicker than by the sweating process described in our last volume. It is also said that the skins are never changed in the tanning vats, only the strength of liquor kept up, by the addition of new and fresh liquors—such as oak or hemlock bark liquor, mixed with hydrochloric acid.

In connection with this subject, let us present some very important information relative to the removal of the hair from the hides, by a process recently brought before the Paris Academy of Sciences, by M. Boudet. While examining into the preparations of arsenical preparations used in France for depilatory powders; and also some of the preparations of the sulphuret of arsenic, lime and water, for the removing of wool from sheepskins, he found that neither the lime, arsenious acid, nor sulphuret of arsenic, had anything to do with the real result, but that it depended on the action of produced sulphuret of lime, formed by the re-action of lime on the sulphuret of arsenic. He proved that sulphuret of *calcium* (base of lime) acted powerfully for the removal of wool and hair from skins when employed alone. This suggested to him the employment of the sulphuret of sodium, or the hydrosulphate of soda (glauber salts) for the sulphuret of arsenic. This new agent succeeded beyond his hopes; so much so, that only a few hours after the application to a sheepskin, he detached the wool easily in one single sheet. The use of the sulphuret of sodium mixed with lime, for the removal of hair from hides, would be more expensive for the materials than Hibbard's process, but if a mixture of glauber salts (hydrosulphate of soda) and lime acts as a good preparation for the removal of hair, and we believe it is, the process may be a very cheap and good one. Some of our tanners should try it, as it is open and free for experiments.

Great Cave Discovered in Indiana.

A great cave has been discovered by a Mr. Coleman and others, about seven miles north of Leavenworth. The party who discovered it followed the main passage some four or five miles, according to their calculation, when they were admonished by their lights that they must return. On their way back, they visited some of the rooms which they had passed, in which they found large beds of epsom salts, in nearly a pure state. It also contains fine specimens of saltpetre, plaster of Paris, alabaster, &c., of which the party procured many fine specimens.

Vinegar and water is said to be an excellent wash for inflamed eyes.

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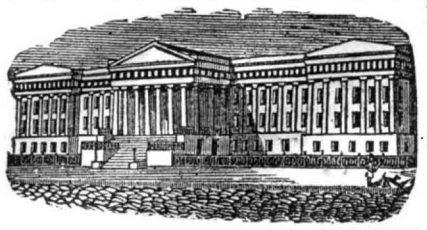

☞Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulationthan anyotherjournal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.
FOR THE WEEK ENDING FEBRUARY 12, 1851.

To Charles Scofield & G. J. Johns, of Albion, Ill., for improved Scraper.

We claim the combination and arrangement of the scoop, standard, beam, arm, and handles, in such a manner, that when the scoop is tipped it will revolve sufficiently far to allow the earth to slide off, and then remain in such a position as that the operator, by a slight movement of the handles, can level down the earth with the scoop, and without the aid of another hand or another scraper, as herein described.

To Samuel & Morton Pennock, of Kennett Square, Pa., for improvement in Seeding Apparatus of a Seed Planter.

We claim the employment of the ring or cylinder, having projections on its periphery, in combination with the notched and toothed cylindrical gauge caps, constructed, arranged, and operated substantially in the manner herein set forth, for increasing and diminishing the size and number of the distributing receptacles, as represented.

We likewise claim the combination of the helical spring, screw shaft, flanged nut, and clamp nut, with the notched and toothed cylindrical gauge caps, to which the ends of the spring are attached, for turning the gauge cap, in order to change the relationship of the teeth or projections of one of the caps, with the teeth or projections on the adjacent cap, for enlarging the distributing receptacles as described in the foregoing.

We also claim the combination of the screw shaft, clutch nut, clutch washer, and clamp nut, with the toothed cylinder caps for enlarging or diminishing the distributing receptacles, as described.

We likewise claim the modifications of the distributing apparatus in their simplified forms, as represented, the several parts being operated in the manner herein set forth.

To Wm. O. Grover, of Boston, Mass., & Wm. E. Baker, of Roxbury, Mass., for improvement in Sewing Machines.

We claim the use of two needles, operating alternately, one working vertically and the other horizontally, substantially as above described, and uniting two pieces of cloth, or forming the seam, by means of the double loop stitch, as set forth.

To John Osborn, of Hamden, Conn., for improvements in operating the Water Gate in Hydraulic Rams.

I claim the use of the regulating slide and nut, or other similar arrangement, in combination with the levers, wires, springs, rods, weights, or other devices, substantially similar to those described, for adjusting the waste valve, and operated on and in connection with a float at the spring or source, which float rises and falls with the water.

I also claim the use of the hammer, resting or falling on a springing piece for opening the waste valve, or starting the hydraulic ram, and worked as described, or in any other similar manner.

To J. E. Ware, of St. Louis, Mo., for method of securing ranges of short plank in pavements.

I claim the method above described, of securing ranges of short pieces of planking of a street or road, in longitudinal lines, over water or gas pipes, by means of screws or keys with staples, aided by the double bevel of the short planks and the ends of the permanent interval planks, severally holding and permitting of the easy removal of such short piece.

RE-ISSUES.

To Harmon Hubbard, of Harrietta, N. Y., (assignor to Wm. W. Reid, of Rochester, N.Y.,) for improvement in Tanning Leather by tanning and acids, previously patented Oct. 16, 1849.

I claim the process of removing hair and wool from skins and hides, and of liming them, so called, preparatory to tanning, by the use of a composition of lime, wood ashes, or potash, and of salt, called Composition No. 1, in the manner above described.

I also claim the use of a composition of lime and wood ashes or potash, without the salt, but I do not claim either of these materials separately by itself.

Second, I claim the process of tanning hides and skins, by the use of any kind of tannin, in combination either with the muriatic acid of commerce, or with muriatic acid, generated by a mixture of sulphuric acid and salt in water, with the tannin, in the manner substantially as described.

Mr. Burke and the Reform of the Patent Laws.

The Washington Republic, of the 13th inst., contains an able letter from the Hon. Edmund Burke, Ex-Commissioner of Patents, defining his position on the Bill now before Congress, for reforming the Patent Laws, from which we select a few extracts. He says:—

"I express myself in very decided terms against that class of persons technically denominated "pirates," who knowingly and wilfully appropriate the inventions of others to their own use; and I also recommended a modification of the patent laws, introducing, among other reforms, the process of *scire facias*, by which good patents may be established, and void and fraudulent ones vacated and set aside.

I am in favor of all proper legislation to reach the *wilful* infringer, and also set aside and avoid all patents, original or re-issued, fraudulently, surreptitiously, or illegally obtained, which are a nuisance to the public, a detriment to the true inventor, and which bring discredit upon the patent system, threatening, in the revulsion of public opinion against it, to sweep it entirely from existence. And with these views I am in favor of Mr. Turney's bill, with the modifications proposed by the Hon. Mr. Norris, from New Hampshire, which will, in my judgement, amply secure both the meritorious patentee and the public in the enjoyment of their mutual rights.

I am aware that from certain sources, by no means including the class of meritorious inventors, but from persons unjustly holding old patents that have been extended or re-issued with enlarged claims, much opposition is made to Mr. Turney's bill. There are some sections in it which merely confirm by legislation reforms in the mode of keeping records in the Patent office, which were introduced while I was Commissioner. It does no harm to confirm those reforms by legislation, nor is it essentially necessary. But they are, indeed, unimportant parts of the bill, and may, without much detriment to the public, be stricken out.

But there are provisions in that bill, and in the amendment proposed by Mr. Norris, which, in my judgement, should be passed as well for the protection of the patentee and the patent system itself as the public; for I hold to the opinion that the public has rights to be protected as well as the patentee.

Section 4 of the new bill provides that, in surrenders for re-issue, the new patent shall embrace only those matters contained in the original specification, drawings, or model. This is certainly right. To go beyond it would open the door to innumerable frauds upon the public and upon individuals.

It also provides that all machines or articles of manufacture, made or begun *before* such re-issue, may be used and sold.

This feature is violently attacked. But is it not just? Who is to be blamed, and who is to suffer, if the patentee, by negligence, or by the incompetency of his agent, shall have failed to notify the public, in his claim, of the extent of his rights—the innocent individual unconscious of wrong, who invests his capital and his labor in a manufacture which *is claimed by nobody*, or the negligent patentee who has failed to give notice to the public, in his claim, of the extent of his invention. That sense of justice existing in the bosom of every honest man will respond that the negligent patentee must suffer, if any one."

[This is very true, but Mr. Burke knows that many patentees have had their claims unjustly curtailed by the Patent Office. We know of some.]

"Section 8 of the bill provides that, when applications are made for re-issues, additions to, or extensions of patents, notice shall be given, and that persons interested may come in and oppose such applications.

When the fact is brought to mind that there is but little responsibility in the examining branch of the Patent Office; and that reissues may be made, if they have not already been, improperly not to say surreptitiously, in spite of the vigilance of the Commissioner, notice to the public, and the privilege of opposing re-issues, (as the public are now permitted to oppose extensions,) seem to me to be eminently just and reasonable.

If such notice had been required when I was Commissioner, a certain well known patent, which has caused much excitement in the country, would never have been re-issued, particularly in the form in which it now exists, and which in my judgement, covers what the original patentee never invented nor claimed. It was done in my absence, and under circumstances which throw very dark suspicions over the propriety of the transaction, so far as the party, the agent, and examiner are concerned. Notice to the public, with the privilege to any person to come in and oppose, would put an end to all such proceedings in the Patent Office."

[The remark about the re-issue relates to the Woodworth patent, we believe. Due notice is now given for extensions, but not re-issues and additions. It is no use to embrace *additions*. Why? Because they will be applied for as new improvements, and it is just as necessary for public notice to be given for new applications. No harm however can result from inserting the clause.]

"Sec. 9 provides that all re-issues and extensions obtained either of the Commissioner of Patents or Congress, surreptitiously or fraudulently, shall be subject to examination in courts of justice, and vacated, if justice require.

This provision is rendered necessary by the conflicting decisions of the courts. In the northern circuit the judges have decided that, in matters of re-issue, the Commissioner is the sole judge, and his decision is binding on courts as well as individuals, unless fraud has been practised on him. Such an interpretation of the law gives no opportunity to correct the errors of that officer founded on mistake or misconduct, if the latter may be supposed ever to occur.

On the other hand, in the Maryland district, a doctrine conflicting with the one just stated is held, and the defendant has been permitted to try before a jury the question whether or not the re-issued patent is for the same invention as that covered by the original patent. Should not these conflicting decisions be reconciled? And should not the official acts of the Commissioner of Patents in any case be subject to revision in courts of justice? I can hardly see how an objection can be raised against a proposition so reasonable.

It remains now to consider the *scire facias* for the repeal of a fraudulent or illegal patent, provided for in section 5. The section, as proposed to be amended, gives the right to *any* person, as in England and France, to sue out the *scire facias* to repeal a patent. It gives the right to a prior patentee to repeal a subsequent patent which infringes his, as well as to any individual interested in any trade or manufacture to repeal a patent, interfering with his business, which he believes to have been unjustly or fraudulently granted. It requires security for costs in the proceeding, and notice to all parties interested in sustaining the patent to appear and defend the same. If the proceeding is not sued out and prosecuted in good faith, it authorizes the court to order a non-suit. If suits, or proceedings in law or equity, are pending in any court of the United States against the person suing out the *scire facias*, it suspends them until the fate of the patent is decided. On the other hand, it compels the person contesting the patent to keep a true account of all profits accruing from the invention in dispute, in whatever part of the United States he may be using the same, and to give ample security that he will pay them over to the patentee, if the latter shall ultimately prevail. In short, it confines the great battle between the parties to a single district, and thus tends to put an end to litigation. Can provisions be more just and equitable between the parties? I think not.

It also provides that, in a second proceeding of *scire facias*, the party suing out the same shall give bonds to respond both costs and damages, in both the *scire facias* and action of infringement, if one may be pending, thus preventing infringement by irresponsible persons.

In my reports I expressed the opinion that one trial in a *scire facias* should perpetually establish the patent. I think, on mature reflection, that such a provision would be too stringent upon public right. Every lawyer, at all acquainted with the practice under the patent laws, well knows that matters avoiding a patent may not come to light for years after it has been issued. Therefore they should always be available, to vacate and set it aside.

I have now given a true view of the bill as it will stand with the amendments offered by Mr. Norris. And, if I am capable of judging the matter, I think they will guard the rights of both the patentee and the public; and they conform mainly to the views expressed in my reports.

[These views of Mr. Burke are well worthy of attention; they impress us with a feeling that the Bill will pass. We would direct attention again to the views we have expressed in Nos. 18 and 19.

Patent Case---Planing Machine.

In the U. S. Circuit Court, Boston, on the 8th inst., before Judge Sprague, in the case of Joseph P. Woodbury vs. E. G. Allen and Joseph G. Russell, the Jury returned a verdict in favor of Russell, there being no proof that he was concerned with Allen in the manufacture of the machine alleged to be an infringement of the plaintiff's patent, but disagreed as to Allen, and were excused. R. Choate and J. Giles for the plaintiff; Wm. Whiting for the defendants. The Court adjourned until Friday, Feb. 21, at 10 A. M.

Iron of the United States.

The most valuable mine is one in Salisbury, Connecticut, which yields 3,000 tons annually. The mines in Dutchess and Columbia counties, in the State of New York, produce annually 20,000 tons of ore, Essex county, 1,500 tons; Clinton, 3,000; Franklin, 600; St. Lawrence, 2,000; amounting in all to more than $500,000. The value of iron produced in the United States in 1835 was $6,000,000, in 1837, $7,700,000.

In Ohio 1,200 square miles are underlaid with iron. A region explored in 1838 would furnish iron sixty-one miles long and sixty wide; a square mile would yield 3,000,000 tons of pig iron; so that this district would contain 1,000,000,000 tons; by taking from this region 400,000 tons annually, (a larger quantity than England produced previous to 1826,) it would last 2,700 years, as long a distance certainly as any man looks ahead! The States of Kentucky, Tennessee, Illinois, Maryland and Virginia possess inexhaustible quantities of iron ore. In Tennessee 100,000 tons are annually manufactured. Notwithstanding our resources, more than one half of our cutlery hardware, railroad iron, &c., is still imported from Great Britain. It is supposed by geologists that the weekly supply of gold from our own mines will be equal to the demand, and that our own mines will yet be more profitable than the mines of Brazil and Columbia.

Russian Candles.

In Russia the candles used in the mines are made of tallow mixed with charcoal dust, (or powdered charcoal,) which is foun to increase the intensity of the light.

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TO CORRESPONDENTS.

"A. V. P., of Me."—The difference of the pressure upon the oar lock by a lever (for the oar is one) at two feet distant and four feet distant, is exactly double.

"D. R., of N. C."—Messrs. R. Hoe & Co., of this city, if you correspond with them, can give you all the information you desire. Circular saws have been used, the one placed above and a little behind the other, to saw through logs, but they are not so good, it is allowed, as the reciprocating saws.

"J. R., of Pa."—Mr. John Martin, of Philadelphia, exhibited a model of a stern sculler to us about a year ago; it is patented. You can get an engine of three horse power in this city for a very small price indeed, about $120. We would not advise you to proceed with the propeller.

"W. M. F., of Pa."—The patent on Parker's Water Wheel expired on the 19th day of last October. It had been extended.

"G. W. D., of Vt."—We don't think the instrument of which you inquire, would be of much service to you in mechanical drawing; it is particularly adapted to landscape sketching, and is useful in taking views of buildings.

"J. B., of N. Y."—We know of no patent granted for making the under millstone the running one, nor do we see how one could be valid, if granted.

"H. M. B., of Vt."—We received yours just after we had finished our editorial relating to to the same subject. Yours is good and to the point. We should have been pleased to have published it, but you will see a diagram like it, on the same subject, in the Franklin Journal, Vol. 6, 1828.

"W. P. H., of Pa.—If you look on page 12, Vol. 5, Sci. Am., you will see engravings of a grass cutting machine, the cutters of which, and yours, are nearly the homologues. We do not think that yours is quite so good.

"J. Y. M., of S C."—Your letter of the 4th inst. is received; the money enclosed has been applied as you requested.

"C. X. S., of Mass."—We believe the engine to which you refer should be termed a *gas* rather than a *steam* engine. Practical engineers who have examined the apparatus, pronounce it impracticable when operated on a larger scale than is necessary to represent its operation. We have no confidence in it, notwithstanding brother Hastings, of the Knickerbocker, has expressed commendatory sentiments in respect to it.

"D. R., of F.W., C.N."—A tube of vulcanized india rubber, easily inflated, would answer the first purpose; this has been done often, but not for the *quadruped*. The French have vulcanized india rubber pontoons, we thought they had been introducee into our army. We have life-preserving mattresses here, made in the manner you suggest. We have no doubt but the invention is original with you, bat you have been anticipated. The plan is good, we would like to see it more extensively introduced.

"W. H., of Ind."—We are obliged to you for your kindness in the list of subscribers sent. Your case is indeed a peculiar one; the courts would surely decide for the original inventor —yourself. The great difficulty in the way is an appearance of abandonment of the invention, which would nullify Mr. C.'s patent also. It is a case upon which we should like to see a decision made. We hope you will send us word about the result.

"W. & P., of Pa."—You ask us about the use of anthracite coal for making glass, as applied by Mr. White, of your place. Cannot anthracite be used just as well as bituminous? What is there new about the application? We do not know what furnace in England may use it, but this we know, that there is plenty of anthracite coal in Wales, as you will see by another article in this number.

"B. N., of N. Y."—There have been several patents secured for tanning leather in a short time by chemical processes. Mr. John E. Larkins, of Balston Spa was the inventor of the improvements for securing the scythe to the snath, but has since deceased. If you have occasion to correspond concerning rights etc., please address the administrators at the above place.

"I. H. G., of Iowa."—If you will send us some good drawings of your loom, or forward us your letters patent, we can then inform you what the expense of engravings published in the Sci. Am. would be. Mr. R.'s name we have entered on our subscription list as you directed.

Money received on account of Patent Office business, since Feb. 12, 1851:—

J. C. T., of Conn., $35; J. V. T., of N. Y., $55; I. V. K., of Mass., $55; T. H., of N. J., $30; C. D. B., of Conn., $40; L. B., of Conn., $30; J. B., of N. Y., $31; W. L., of N. Y., $25; G. R., of Conn., $20; J. W., of Mich., $20, and C. A., of Pa., $30.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and the year the patent was granted (adding the month of the year when convenient), and enclosing one dollar as fee for copying.

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Patent Office.

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NOTICE TO INVENTORS.—Inventors and others requiring protection by United States Letters Patent, are informed that all business relating to the procuration of letters patent, or filing caveats, is transacted at the Scientific American Office, with the utmost economy and despatch. Drawings of all kinds executed on the most reasonable terms. Messrs. Munn & Co. can be consulted at all times in regard to Patent business, at their office, and such advice rendered as will enable inventors to adopt the safest means for securing their rights.

Arrangements have been made with Messrs. Barlow, Payne & Parken, Patent Attornies, in London, for procuring Letters Patent in Great Britain and France, with great facility and dispatch.

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TRANSIT AND LEVEL, for sale, suitable for Railway Engineers; the Transit is one of the best instruments for running curves or surveying; both made by Young, of Philadelphia. Being engaged in other business, they will be sold for $90 each. Address, post-paid, GEORGE W. HEYBERGER, No. 68 North Third st., Philadelphia. 1*

A YOUNG MAN, a Mining Engineer, who has been surveyor and manager of silver mines and smelting houses, in Mexico, wants a similar situation in this country. He is well instructed in all the branches of mining science—speaks English, French, German, and Spanish, and possesses very good testimonials Address F. S., 218 William st. 23 2*

TO WOOLEN MANUFACTURERS.—For sale, a Wool Carding, Dyeing, and Cloth Dressing Establishment, situated in the town of Somers, Westchester Co., N. Y. The building is in good repair, and the machinery in perfect running order. The location of the establishment affords the best facilities for country manufacturing. Further information may be obtained by addressing the subscriber at Peekskill, N. Y., or personal application made to him on the premises. R. C. VERNOL. 23 2*

WILLIAM W. HUBBELL—Attorney and Counsellor at Law, and Solicitor in Equity, Philadelphia, Penn.

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MODELS AND PATTERNS.—The subscriber begs leave to inform inventors, machinists and others, that he is prepared to execute, in a first rate manner, and at short notice, all kinds of Models and Patterns. He trusts that his experience and strict attention to business will secure him a liberal patronage. Unquestionable references given if required. All orders strictly confidential. ROBERT F. BEEBEE, 131st st., near 4th avenue, Harlem. 22 2*

DEEP WELL BORING IN ROCK.—The undersigned, having been extensively engaged in this business for several years, on the great Kanawha River, Va., with entire success, offers his services to the public, in boring wells for gas, salt water, or any minerals, to the depth of 2,000 feet or more if required. Satisfactory references will be produced by addressing the subscriber (post-paid) at Kanawha Salines, Va., to C. W. ATKISON. 22 2*

WORLD'S FAIR ART UNION—Incorperated by the New York Legislature; shares $5 each. Fifty Prizes. A Prize is a first cabin passage to London and back, and $100 to pay expenses while in London. In addition every subscriber has a magnificent engraving of the interior of the Great World's Fair—really worth $5. The subscription list is filling rapidly, and as the number of shares is limited by the charter of incorporation, application for shares should be made forthwith. A remittance of $45 will entitle the sender to ten shares Remittances by mail will be at the company's risk. Drafts to be made payable to the order of the secretary. Funds current at the place whence sent taken at par. All letters must be pre-paid. Shares, or further particulars may be obtained on application, personally, or by paid letter, at the office of the World's Fair Art Union, 50 Wall st., N. Y. By order, J. TOWNSEND, Sec'y. 223*

THE NASHVILLE MANUFACTURING Company (chartered by the State of Tennessee) being now engaged in the erection of extensive machine works, wish to engage the services of a person thoroughly competent to manage the same. It is the intention of the Company to engage extensively in building locomotives, steam engines, &c. None but such as can furnish undoubted testimonials for skill, energy, and other requisites to fill the station, need apply. The Company also wish to employ a number of machinists, founders, &c., and would also receive propositions for the necessary tools, &c., for such an establishment. Immediate application, by letter or personally, to the undersigned, will meet attention.

S. D MORGAN, Prest. Nashville Man. Co.
Nashville, Tenn., Jan 17, 1851. 21 6*

TO LUMBER DEALERS.—Law's Planer having undergone important alterations, is now perfected and in successful daily operation, facing and matching at the same time, and in both respects, in a style not to be surpassed. The common objection that machines are expensive in repairs, is not applicable to these new machines—they are simple, strong, and easily kept in order. It is confidently believed that when they are well known they will have a decided preference over any other machine or mode of planing. Planing of all kinds done at short notice, corner of Water and Jay sts., Brooklyn. Law's Stave Machine dresses and joints staves of all kinds, shapes, and widths, by once passing through. Rights or machines for sale by H. LAW, 216 Pearl street, or after 1st March, at 23 Park Row. 21 8

HUTCHINSON'S PATENT STAVE MACHINE.—C. B. HUTCHINSON & CO., Waterloo, N. Y., offer for sale town, county and State rights, or single machines, with right to use the same. This machine was illustrated in No. 2, Vol. 5, Sci. Am.; it will cut from 1,500 to 2,000 perfect staves per hour. We manufacture machines of different sizes, for keg, firkin, barrel and hogshead staves; also, heading shingle, and listing and jointing machines. These machines may be seen in operation at St. Louis, Mo.; Chicago, Ill.; Savannah, Ga.; Madison, Ia.; Ithaca, N. Y.; Waterloo, N. Y.; Bytown, C. W. Letters directed to us, post-paid, will receive prompt attention. 15 3m*

LEONARD'S MACHINERY DEPOT, 116 Pearl st., N. Y.—The subscriber has removed from 66 Beaver st. to the large store, 116 Pearl st., and is now prepared to offer a great variety of Machinists' Tools, viz., engines and hand lathes, iron planing and vertical drilling machines, cutting engines, slotting machines, universal chucks, &c. Carpenters' Tools—mortising and tennoning machines, wood planing machines, &c. Cotton Gins, hand and power, Carver Washburn & Co.'s Patent. Steam Engines and Boilers, from 5 to 100 horse power. Mill Gearing, wrought iron shafting and castings made to order. Particular attention paid to the packing, shipping, and insurance, when requested, of all machinery ordered through me. P. A. LEONARD. 15 3m

SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., will have finished 2 Power Planers ready to ship by the 1st of Feb., that will plane 9 feet long, 31 inches wide, and 24 inches high, with angle feed; counter shaft, pullies, and hangers, splining and centre heads, with index plate, and weigh over 5,000 lbs.; also 2 power planers that will plane 5 feet long, 22 in. wide, and 20 in. high, with counter shaft, pullies, and hangers, and weigh 2,400 lbs.—These planers are 25 per cent. lower than any others built. Cuts can be had by addressing as above, post paid. 19tf

LINEN AND HEMP MACHINERY.—I am prepared to contract with companies or individuals for the building of machinery by which linen can be produced as cheap as cotton, from either unrotted hemp or flax; also for making rope or bagging of unrotted hemp—the same machinery which I am now successfully using in the manufacture of kyanized cordage. O. S. LEAVITT.
Maysville, Ky., Jan. 23, 1851. 21 4*

PATENT DREDGE BOAT.—The subscriber having obtained a patent for improvements on the Dredge Boat, offers to sell rights to build and to use his Patent Dredge Boat in any part of the United States; the excavating apparatus consists of twenty scoops, preceded by plows receiving great pressure, and are capable of raising eight or ten cubic yards of mud or gravel per minute; the scooping apparatus may be fitted on an old steamboat or other vessel, for the purpose of removing bars or other obstructions to navigation. A working model may be seen by calling on the subscriber. JAMES CALLAGHAN,
20 10* No. 64 Spruce st., New Bedford, Mass.

CLOCKS FOR CHURCHES, PUBLIC Buildings, Railroad Stations, &c.—The subscriber having made important improvements in the apparatus for counteracting the influence of the changes of temperature upon the pendulum, and in the retaining power, together with a most precise method of adjusting the pendulum to correct time, are prepared to furnish Clocks superior to any made in the United States, both for accuracy of time-keeping and durability. They speak with confidence, from having tested their performance for several years. All clocks ordered and not proving satisfactory, may be rejected. Address SHERRY & BYRAM,
Oakland Works, Sag Harbor, L. I.
"Mr Byram has established his reputation as one of the first clock makers in the world"—(Scientific American. 17 5eow*

BROOM MACHINERY.—The most improved and durable machinery for the manufacture of Brooms, for sale by JACOB GRAY, Scotia, Schenectady Co., N. Y. Address post-paid. 22 8*

MATAPAN MACHINE WORKS—Corner of Second and A sts, South Boston. The undersigned have recently enlarged their business and are now prepared to offer a great variety of Machinists' Tools, viz., Engine and Hand Lathes, iron Planing and Vertical Drilling Machines, Cutting Engines, Slotting Machines, and Universal Chucks; also Mill Gearing and Wrought Iron Shafting made to order.
22 12* GEO. HEPWORTH & SON.

DICK'S GREAT POWER PRESS.—The public are hereby informed that the Matteawan Company, having entered into an arrangement with the Patentee for the manufacture of the so-called Dick's Anti-Friction Press, are now prepared to execute orders for the following, to which this power is applicable, viz.—Boiler Punches, Boiler Plate Shears, Saw Gummers, Rail Straighteners, Copying and Sealing Presses, Book and Paper Presses, Embossing Presses, Presses for Baling Cotton and Woollen Goods —Cotton, Hay, Tobacco, and Cider Presses; Flaxseed, Lard, and Sperm Oil Presses; Stump Extractors, &c. &c. The convenience and celerity with which this machine can be operated, is such that on an average, not more than one-fourth the time will be required to do the same work with the same force required by any other machine.
WILLIAM B. LEONARD, Agent,
13tf No. 66 Beaver st., New York City.

MACHINES FOR CUTTING SHINGLES. The extraordinary success of Wood's Patent Shingle Machine, under every circumstance where it has been tried, fully establishes its superiority over any other machine for the purpose ever yet offered to the public. It received the first premium at the last Fair of the American Institute—where its operation was witnessed by hundreds. A few State rights remain unsold. Patented January 8th, 1850,—13 years more to run. Terms made easy to the purchaser. Address, (post-paid) JAMES D. JOHNSON, Redding Ridge, Conn., or Wm. WOOD, Westport, Conn.. All letters will be promptly attended to. 10tf

GURLEY'S IMPROVED SAW GUMMERS—for gumming out and sharpening the teeth of saws can be had on application to G. A. KIRTLAND, 205 South st., N. Y. 10tf

A CARD.—The undersigned begs leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools, also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style, which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools, and manufacturer of Mathematical Instruments, 154 Fulton street. 1 6m*

TO PAINTERS AND OTHERS.—American Anatomic Drier, Electro Chemical graining colors, Electro Negative gold size, and Chemical Oil Stove Polish. The Drier, improves in quality, by age—is adapted to all kinds of paints, and also to Printers' inks and colors. The above articles are compounded upon known chemical laws, and are submitted to the public without further comment. Manufactured and sold wholesale and retail at 114 John st., New York, and Flushing, L. I., N. Y., by
QUARTERMAN & SON,
22tf Painters and Chemists

MACHINERY.—S. C. HILLS, No. 12 Platt Street, N. Y., dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills Kase's, Von Schmidt's, and other Pumps, Johnson's Shingle machines, Woodworth's, Daniel's and Law's Planing machines, Dick's Presses, Punches, and Shears; Mortising and Tennoning Machines, Belting, machinery oil; Beal's patent Cob and Corn Mills; Burr Mill, and Grindstones, Lead and Iron Pipe, &c. Letters to be noticed must be post paid. 10tf

BAILEY'S SELF-CENTERING LATHE, for turning Broom and other handles, swelled work, chair spindles, &c.; warranted to turn out twice the work of any other lathe known—doing in a first rate manner 2000 broom handles and 4000 chair spindles per day, and other work in proportion. Orders, post-paid, may be forwarded to L. A. SPALDING, Lockport, N. Y. 21tf

FOREIGN PATENTS.—PATENTS procured in GREAT BRITAIN and her colonies, also France Belgium, Holland, &c., &c., with certainty and dispatch through special and responsible agents appointed, by, and connected only with this establishment.—Pamphlets containing a synopsis of Foreign Patent laws, and information can be had gratis on application
JOSEPH P. PIRSSON, Civil Engineer,
7tf Office 5 Wall street, New York.

RAILROAD CAR MANUFACTORY.—TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of Railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty and good taste, as well as strength and durability, we are determined our work shall be unsurpassed. JOHN R. TRACY,
16tf. THOMAS J. FALES.

FOWLERS & WELLS, Phrenologists and Publishers, Clinton Hall, 131 Nassau st., New York—Office of the Water Cure and Phrenological Journals. Professional examinations day and evening. 3 6m

MANUFACTURERS' FINDINGS and Leather Binding.—The subscriber is prepared to offer a large assortment of manufacturers' Findings for Cotton and Woollen Factories, viz., bobbins, reeds, harness, shuttles, temples, rockers, harness twines varnish, roller cloth, card clothing, card stripper and clamps, calf and sheep roller, leather, lace, and picker string, potato & wheatstarch, oils, &c. Leather Banding, of all widths, made in a superior manner from best oak tanned leather, rivetted and cemented.
15 3m P. A. LEONARD, 116 Pearl st.

UNITED PATENT OFFICE IN PARIS AND LONDON.—GARDISSAL & CO., 9 Arthur st., west, city, London; Paris, 29 Boulevard St. Martin.—Procuration of Patents for England, Ireland, Scotland, France, and all countries; and transactions of all business relating to patents, (sale and licenses,) specifications, oppositions, &c. "The Invention," monthly journal, $1 a-year. 15 4m*

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1 1-4 to 7 inches in diameter. The only Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine, and other Steam Engine Boilers.
THOS. PROSSER & SON, Patentees,
16tf 28 Platt st., New York.

STRAW CUTTER FOR SALE.—We have on hand one of Macomber's Improved Straw Cutters, patented Nov. 5, 1850, illustrated in No. 50, Vol. 5, Sci. Am. Price $10. Address MUNN & CO.

THE SUBSCRIBER is now finishing four 14 horse engines, with boiler and apparatus all complete—price $1200 each. Several 6 horse engines extremely low; also, several of smaller capacity, complete; also, several power planers, now finishing.—Galvanized chain for water elevators, and all fixtures—price low—wholesale and retail. Orders, post-paid, will receive prompt attention. AARON GILBORN.
No. 4 Howard st., New Haven, Conn. 18 10*

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Scientific Museum.

Butter.

Milk is the most natural and common food of man. Out of milk two other common articles of food are obtained, viz., cheese and butter; butter exists in the form of very small globules, and out of 100 parts of cow's milk, 3·75 parts of butter are obtained. Human milk contains about one-sixth more butter than the above. Butter is indebted to a substance called "butyrine" for its fine flavor. Casein, the cheesy matter of milk, if not well removed from the butter, by working and washing, soon putrifies, and will give the butter a bad taste. Butter does not appear to have been known to the ancients, at least so far as history reveals knowledge, but we cannot believe that butter was not known to them for all this. We read of "a land flowing with milk and honey," but no butter, still this is not conclusive against the reasonable conclusion that the old Hebrews did know what it was. The oldest hint, historically, about butter, is given by Herodotus, who ascribes the use of it to the Scythians. Hippocratus also alludes to the Scythian butter, and recommends its use externally for medicine. In the time of Galen butter was known and used, but to a very limited extent, among the Greeks and Romans; in the second century Pliny ascribes the invention of butter to the Germans, but this only shows that the Romans became acquainted with it through the Germans. It was much used as a pomatum both by the Greek and Roman ladies. Pliny recommends it to be mixed with honey and rubbed over the gums of children to ease the pain of teething, and for ulcers in the mouth—a hint that may not be useless to us moderns. The Romans anointed the bodies of their children with butter to make them pliable, and it appears that they did not know butter as we do, in firm cakes, but only as a semi-fluid, like thick olive oil. This is not wonderful, owing to the general warmth of southern Italy. Neither the Spaniards nor Portuguese know much about butter, and the inhabitants of Mexico seldom eat it. In the city of Mexico it costs one dollar per pound; the most wealthy classes do not use so much of it as the poorest amongst us; in fact they do not consider it an essential article of food,—we do, and could not, to use a common phrase, "live without it." It is justly believed that more butter is consumed in the northern States of America than in any other country having the same amount of population in the world. The Hollanders are distinguished for making good butter, so also are the Northern Germans, Norwegians and Danes The English, Irish, and Scotch make and consume a great deal of butter, especially the Scotch, who are, or at least were, almost half Jewish in their feelings towards the use of pork and lard.

The great secret of making good butter, is cleanliness and plenty of elbow grease. In some parts of Ireland, but especially in Devonshire, England, and Ayrshire, in Scotland, the butter made has had a world-wide fame. The plan pursued seems to be for the dairy-maids to wash their understandings, and perform the same operations as the French and Portuguese who dance among the grapes at the wine press. By having large tubs with false bottoms, covered with clean coarse cloth, into which the butter is placed and danced upon, with water to wash it as much as is required, all the cheesy matter is pressed through the coarse cloth and runs off with the water of cleansing. This is a most efficient and effectual way of working butter for packing. As a general thing, the kind very common in our makets depends for its weight in having a good deal of the milk left in it, and none of the cheesy matter pressed out—it is a profitable way of producing it *for sale*. Butter for foreign countries should be well tramped or beat and washed some way, and it should be packed in a dish placed in the inside of a larger one, big enough to fill around it with salt.

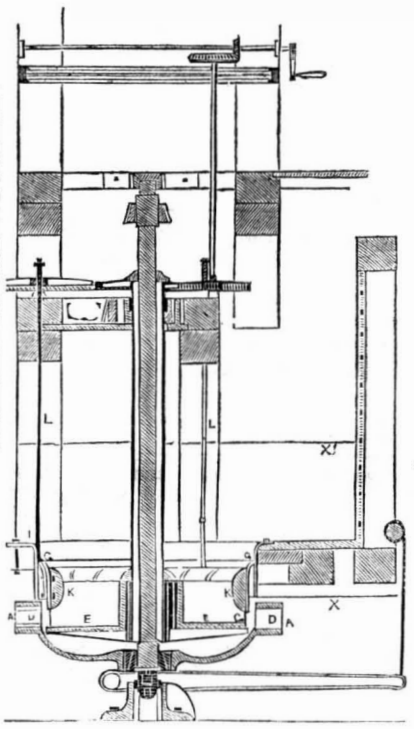
Rancid butter can be completely cured of its bad taste and smell, by melting it in a clean tin dish, adding some saleratus, and straining it through a clean cloth. After this it appears of a different form; it crystalizes in soft round crystals, and has no taste like what it would have had, if made well at the first operation. All rancid butter for cooking should be treated this way; it changes the butter, takes away the bad smell, prevents it from spoiling again, however long kept, and it really has a beautiful appearance. The butter should be kept stirred after it is all dissolved for about ten minutes. One ounce of saleratus will purify four pounds of butter. A thick sediment falls to the bottom, and a very thick scum gathers on the top. Butter is one of the finest articles of human food. The farmer with his snowy white bread and beautiful golden butter for breakfast, dines richer than the monarch to whom those things are denied.

For the Scientific American.

Hydraulics.

(Continued from page 176.)

FIG. 28.



FOURNEYRON'S TURBINE.—The accompanying figure (28) represents a vertical inside view of Fourneyron's Wheel and connected machinery. The essential parts are the ring with curved buckets and the sluice. The wheel, A A, is made of an upper ring and a ring below, cast in one piece, with a concave bottom, C. These two rings are joined together by the curved buckets, D D, made of strong sheet metal. The sluices consist of a bottom plate, E E, connected with a hollow cast iron pipe, which encloses the main shaft of the wheel, and is sustained on the upper part; on this plate the curved guides, seen in fig. 28, (and those in fig. 27, last number), stand vertically, to give the water its proper direction for entering the buckets of the wheel; G G is a hollow cylindrical casting, interposed between the wheel and directing curves, and forms the sluice gate. This cylinder moves concentric to another fixed one, I I. When the movable cylinder, G G, is raised, the water runs out between its lower edge and the plate, E E, and can then enter within the wheel. The curved guides allow the water to enter the wheel without any sensible shock, and the water is directed on the side contrary to the motion of the wheel. To get the full value of power, the water must enter the wheel with almost no sensible shock, and escape from the sluices of discharge with almost no velocity; K K are wooden cushions fixed to the sluice gate, and slipping between the curved guides, and being of a rounded form at their lower parts, diminish the effects of contraction on the sides. The sluice gate is moved by rods, L L, cut into screws on their upper parts, and around which the return three pinions of equal diameter, which answer the purpose of screw nuts, and which are put in motion by a wheel concentric with a vertical pipe, which surrounds the main shaft. This always raises and lowers the cylinder sluice gate plumb. The main shaft passes through the hollow tube, and has on its upper part a cog-wheel to transmit motion to other machinery. The main shaft works in a socket of a step, and can be raised or lowered, as may be required. X' is the upper water level, X is the lower.

Hair Dyes.

The coloring of hair, while growing, is an object of some consequence to those who have not the natural good fortune of enjoying sable locks. The use of chemicals for coloring the hair is very common among the civilized nations of Europe and America. Red heads are foolishly abominated in no country more than our own. The prejudice is no doubt inherited from our English and Irish ancestors, who had such a hearty hatred of the Danes—the red-haired race. They had felt the iron hand of Denmark, and it was held to be a most unlucky event to meet a red-haired man first in the morning, but above all, a year's misfortune to meet a red-haired man first on New Year's Day. Deep auburn locks with a reddish hue, were held to be the most beautiful of any, and among the nations of the East—in some parts of Turkey—red hair is fashionable, and ladies with fine sable ringlets often make them red with pigments. In Persia, too, blue beards are common—old men of seventy may be seen with fine blue beards, so there is no accounting for fashion, "'tis all a matter of whimsical flourish," as Dibden would say.

It has been asserted that the use of the tincture of sulphur and sugar of lead had changed old Gov. Twiggs from a gray-haired veteran to a brown-haired Adonis, consequently this lotion has become not a little fashionable, but better far to wear the gray than indulge in such vile practices.

The general hair dyes are made of lead and silver compositions. A lead comb, with the use of oil, makes the hair sleek and jet, but then it is a fine way to keep the hair in the negative condition of cleanliness.

Liquids made of the nitrate of silver are the common hair dyes. In powder the nitrate of silver, if made into a paste, and rubbed into a fiery set of whiskers, then bound up with a cloth for five or six hours, will change them to a black. This is merely causticizing them, and the silver sticks like lime. It can be got off, however, without a great deal of trouble. The nitrate of silver, in liquid, is the common hair dye. It is most effectual, but it is best to apply it repeatedly and to have it very weak, or otherwise it will prove very injurious to the system. In alcoholic lotions for the hair, a very small quantity of the bichromate of potash, which is of a yellow color, will affect the hair and make it darker. It takes a long time before its effects are observed but they are no less sure on that account. This is a very safe substance to use, but care must be exercised in using only a very small quantity, or the color will be of too deep a yellow in the liquid.

It has been said that the Chinese have a method of treating with food, so as to change the system and give a permanent black head of hair. This is altogether an assertion, without a single fact for proof. Different nations are distinguished for their general complexion, —the Fins are red, the Scotch, brown, the Spaniards, black, and great numbers of the Irish have peculiarly fine blue-black hair; the Americans are of every hue, because made up of all nations. Those who are fond of coloring their hair to change it from a light to a dark color, can easily do so by applying to the perfumer. We have never seen a change made from a black to light hair, but we have met not a few red-headed mulattoes, they seemed to pride themselves on their sanguine appearance, but of all men we ever saw they appeared to require the nitrate of silver most.

Potatoe Rot.

A short time ago we published the following article, with the exception of the corrections. The errors were made very naturally by the copy—it being difficult to tell some words from those nearly similar, owing to the hand writing. The subject is so important that there should be no room left for doubt; this is positive.

"I saved a fine crop of potatoes in mid New York, the last Season, by using the plaster of Paris, while my neighbors lost theirs almost entirely by the rot. My best planting was an upland second crop from the sod, (I think a first crop would have been better); it was planted about the first of June, hoed once, and a handful of plaster cast over the vines immediately after hoeing. I should have cast it upon the seed, also, before cover, if I had provided it to hand. When dug from the hill, they were separated (5 per cent. only being affected, and those with the dry rot only) and spread on the floor of my wagon-house, until thoroughly dry and the weather compelled me to remove them to my cellar: when they were spread out about a foot thick, over a large bin, where the air can circulate beneath; and they have kept perfectly well. Plant so late that your vines will not mature and dry up in the drought of harvest, on lands not subject to frost, and secure the fall growth of large and fine tubers, use the plaster freely, and you need not fear the rot." GREEN.

Spectacle Lenses.

Dr. Wollaston introduced a new kind of spectacles, called periscopic, from their property of giving a wider field of distinct vision than the common ones. The lenses used for this purpose are meniscuses, in which the convexity predominates for long sighted persons; and concavo-convex lenses, in which the concavity predominates for short-sighted persons. Periscopic spectacles decidedly give more imperfect vision than common spectacles, because they increase both the aberration of figure and of color; but they may be of use in a crowded city, in warning us of the oblique approach of objects.

LITERARY NOTICES.

BRAITHWAIT'S RETROSPECT OF PRACTICAL MEDICINE AND SURGERY: Part 22, American Edition.—We are indebted to Daniel Adee, 107 Fulton street, for the January Number of this copious and valuable Journal. It embraces 377 pages and 168 articles, from the pens of the most celebrated European physicians. Every medical practitioner in our country should possess himself of each number of the Retrospect. The whole series, from No. 1 to 22, inclusive, can be had for $13,50. Two numbers per year $1,50.

DICTIONARY OF MECHANICS AND ENGINE WORK.—No. 21 of this work, published by D. Appleton & Co., is issued, and contains treatises on iron, with many engravings, likewise articles on Japanning and Joining of Timbers, Kilns, Knives, &c. It is a very good number. The name of Oliver Byrne, as Editor, has disappeared, we see from the cover.

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The Publishers of the SCIENTIFIC AMERICAN respectfully give notice that the SIXTH VOLUME of this valuable journal, commenced on the 21st of September last. The character of the SCIENTIFIC AMERICAN is too well known throughout the country to require a detailed account of the various subjects discussed through its columns.

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10 " 12 " $15 | 20 " 12 " $28

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PREMIUM.

Any person sending us three subscribers will be entitled to a copy of the "History of Propellers and Steam Navigation," re-published in book form—having first appeared in a series of articles published in the fifth Volume of the Scientific American. It is one of the most complete works upon the subject ever issued, and contains about ninety engravings—price 75 cents.

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